The Fremont Economy: Present Realities and Future Possibilities

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I. EXECUTIVE SUMMARY

Fremont, along with the entire five-county region that makes up the core of the Bay Area, experienced rapid employment growth in the late 1990s and saw the expansion of high-tech or "new economy" industries. Fremont's growth far outpaced that of the rest of the region, with employment expanding by over 60 percent from 1992 to 2000. By far the highest growth rates were registered by new economy industries, namely software, biotechnology, and new economy manufacturing[1], which increased employment by 536 percent, 447 percent, and 133 percent, respectively. Fremont's semiconductor industry[2], which is included in new economy manufacturing, increased by 900 percent.

Despite these high growth rates, software and biotechnology combined still account for only about 7 percent of Fremont's total employment. New economy manufacturing, in contrast, is one of the city's primary industries, accounting for roughly 19 percent of total employment. Semiconductors as measured by SIC 3674 are only about 4 percent of total employment; however, when all semiconductor-related employment is taken into account the industry may in fact account for 10 percent or more of the city's employment.

Telecommunications, wholesale trade, business services, and traditional manufacturing posted moderate growth rates, more or less maintaining their share of the city's employment, while construction, public administration, health services, and retail and consumer services grew slowly and saw their share of total employment decline. Because of these trends, roughly one quarter of the city's job base is now in new economy industry groups (biotechnology, new economy manufacturing, software and telecommunications) and these groups account for a disproportionate share of the city's employment growth. Nevertheless, Fremont's traditional industry groups—business services, retail and consumer services, and traditional manufacturing—still account for a significant portion of the economy and contributed 30 percent of Fremont's job growth from 1992 to 2000. Thus, although the city's economy is increasingly tied to new economy industry groups, other industries continue to play an important role.

Overall, Fremont's economy has performed well in the regional context. Most industry groups are strong, with the only notable exceptions being construction, health services, retail trade, and traditional manufacturing. This last one is judged as weak not so much because of its performance in Fremont compared to the region, but rather because of its lackluster performance at the regional level, which indicates that it is on the decline in the region and should not be counted on as a source of future growth in Fremont.

The weakness of Fremont's retail sector is evident not so much in employment trends but rather in per-capita taxable sales, an area in which Fremont lags behind its neighbors and Alameda County as a whole. This is an indication that there is significant retail "leakage" out of Fremont, i.e., Fremont residents are spending money in other cities that could, in theory, be captured by local retail establishments. The problem does not appear to be a shortage of retail space, but rather underperformance by existing retail, which has not capitalized on the presence of a prosperous and ethnically diverse population in the city that would support high-end retail catering to a variety of cultural groups.

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[1] New economy manufacturing includes the manufacture of electronic components, computers, semiconductors, sophisticated industrial machinery, and so on.

[2] Most of the data presented herein on the semiconductor industry use industry code 3674 of the Standard Industrial Classification (SIC) system as a proxy for the entire industry, which is in reality spread out over a number of different industry codes.

Venture capital (VC) investments are an additional indicator of industry strength. Overall, Fremont is a significant recipient of VC funds, receiving roughly 7 percent of the amount invested in neighboring Santa Clara County. This is roughly in line with relative employment levels, since Fremont's total employment is about 9 percent of the level in Santa Clara County. However, a closer examination reveals significant differences among different sectors. Biotechnology and semiconductors both capture more and larger investments than would be expected given Fremont's standing relative to Santa Clara County; biotech firms tend to receive more early-stage investments, whereas semiconductor firms at all stages of their life cycles are strong in Fremont.

Software, in contrast, is notable for its low level of VC investments. This may be due to a number of factors, but the clear conclusion is that Fremont is not viewed as a desirable home for larger software firms. Software start-ups either remain small or move out of Fremont when they begin to grow. This suggests that Fremont's software sector is not as strong as employment growth would suggest.

Part of the reason for these divergent performances is geography: high-tech industries show different spatial patterns at the regional level, and this has an impact on Fremont's ability to compete. New economy manufacturing in general, and semiconductors in particular, are highly concentrated in Santa Clara County, whereas biotechnology and software show much more willingness to decentralize. New economy manufacturing is for the most part not willing to locate far from the heart of Silicon Valley, and Fremont is a desirable location that is close but significantly less expensive. Software, in contrast, has decentralized quite a bit: tendency: the Tri-Valley area has seen rapid software growth and accounts for the majority of Alameda County's jobs in this industry group. The Tri-Valley offers abundant, high-quality, relatively inexpensive commercial and residential real estate that appeals to software firms that do not feel the need to be close to the heart of Silicon Valley. Most of the more location-sensitive firms find Fremont to be too far from their prime locations. Thus, Fremont's competitive edge is weaker than in other industry groups.

Despite certain weaknesses, Fremont's overall economic picture is positive. The city has performed well thanks to a number of key assets, namely:

- Diversity in the city's economy, population, and built environment.
- Good schools that attract educated residents.
- Favorable geography close to Silicon Valley but far enough to have lower cost of business.
- A high-quality and relatively affordable real estate stock that attracts firms that can't pay to locate in the heart of Silicon Valley.
- Community quality, notably good schools, unique neighborhoods, high quality of life, and an atmosphere that is welcoming to diverse ethnic and religious groups.
- Transit links to San Francisco, northern Alameda County, and the Tri-Valley area via BART and to the Tri-Valley, Central Valley, and San Jose via the Altamont Commuter Express. The BART extension to San Jose will dramatically improve Fremont's transit links.
- A talented, prosperous, diverse, and entrepreneurial resident base.

The report highlights these assets and recommends that the city's economic development strategy start by building on them. As the discussion of software location decisions demonstrates, Fremont cannot match the assets of some other cities in the region. Therefore, it should not attempt to compete on those terms, but instead should focus on its own strengths and turn them into even more powerful competitive assets.

Such a strategy would involve enhancing the current diversity of Fremont's neighborhoods, better understanding and capitalizing the city's place in the region's geography, ensuring that appropriate real estate is built to meet the needs of the firms most likely to locate in Fremont, developing at higher

densities to use land more efficiently and capture more growth, focusing on quality of life and community amenities, and better capitalizing on transit by developing more intensively around stations. Maintaining the quality of Fremont's schools should be considered a key part of the city's economic development strategy.

In addition, Fremont can create new assets by focusing on physical planning to create unique places, pushing for improved connections to other parts of the region, and forging a stronger identity and image to project as the Bay Area's fourth-largest city. A vibrant mixed-use downtown would help the city meet many of its goals by providing more diversity in the housing stock, creating space for software start-ups that may choose to grow in Fremont, providing a unique retail environment with a wider variety of choices, and locating more intensive development near transit. Place-making efforts should not be limited to the central business district; the city can enhance its physical diversity, its image, and its range of housing choices by focusing on residential neighborhoods, building on their diverse historical characters and creating amenities that allow them to continue to attract talented residents.

Chapter 9 lays out the report's findings and recommendations in a more detailed but still concise form.

II. INTRODUCTION

With its strong and diversified economic base and relatively affordable real estate, Fremont is entering the 21st century with tremendous economic potential. The city already has a regional identity as a center of manufacturing activity due to its extensive built industrial space, business-friendly climate, and local labor force. But the 1990s were a time of rapid change in Fremont: the city's economy became more and more closely tied to "new economy" industries such as semiconductors and biotechnology while some of the city's more traditional industry groups, such as manufacturing, held even or declined. Fremont now has both feet planted firmly in the new economy, but this fact alone will not ensure prosperity or high quality of life.

Fremont's success in the 1990s puts the city in a strong position to compete in the current decade, but success cannot be taken for granted. Other parts of the region show great promise in some industries, and despite Fremont's accomplishments the city faces significant challenges. Moreover, the city's role and identity at the regional level is unclear. Fremont is the fourth-largest city in the Bay Area, but lacks the presence of San Jose, San Francisco, and Oakland, not to mention a number of smaller cities. In order to build on its record of success, Fremont must understand its place in the region and fashion a competitive strategy based on its existing assets and new assets that it can create. Diversity, good schools, a favorable geographic location, and transit are among the city's key assets.

Fremont is not just a city of jobs, it is also a city of neighborhoods and people. In fact, neighborhoods and residents are important—if sometimes overlooked—assets. Historic districts like Niles and Centerville add flavor and variety to the city, and Fremont's diverse population is changing the city's cultural *and* economic life. Yet it may not be immediately clear in just what ways Fremont is changing, or how best to take advantage of the city's assets from an economic development point of view.

This study examines Fremont's place in the regional economy and identifies its competitive strengths and weaknesses. Data on employment trends, venture capital investments, and retail spending show how Fremont is performing relative to the region and to its neighbors, as well as how the city's economy is changing. The report also examines the city's demographic characteristics, the distribution of economic activity throughout the various subareas, and real estate. Quantitative data are supplemented by qualitative information derived from interviews with business managers, real estate brokers, and venture capitalists. The Technical Appendix discusses both quantitative data and interview methodology.

Chapter 3, Economic Context, examines the regional economy, the Fremont economy, and Fremont's performance within the region. Chapter 4 discusses Fremont's key assets that have helped the city compete effectively in the region. Chapter 5, Spatial Patterns, looks at the distribution of economic activity in Fremont. Chapter 6 presents data on the wages in Fremont's industries as a way of measuring the quality of the city's jobs. Chapter 7 examines retail performance and taxable sales in Fremont. Chapter 8 looks at real estate in Fremont by product type and subarea. Finally, Chapter 8 summarizes the key points in a series of findings and then concludes with recommendations about ways to build on past successes and create new opportunities.

III. ECONOMIC CONTEXT

This chapter examines the economic changes that the region[3] has experienced in the last decade and looks at Fremont's position relative to the rest of the region. Two types of data are presented—employment data and venture capital investments. Each reveals something different about the city's economic performance.

Employment data are used as the main indicator of economic growth and change in the region and in Fremont. For the purposes of the employment analysis, the economy has been broken down into thirteen industry groups (twelve principal and one subsidiary), shown in Table 1. These industry groups have been defined in consultation with city staff with the structure of the local and regional economy in mind and in order to highlight key trends in Fremont's employment base.

Table 1: Industry Groups Used in Analysis

Industry Group	Description
Biotechnology	Pharmaceuticals, medical instruments, research and development services.
Business Services	Banks and financial institutions, hotels, insurance, security, transportation services, real estate, legal services, etc.
Construction	Heavy construction, residential and non-residential construction, specialty contractors.
Retail and Consumer Services	Arts, entertainment, recreation, consumer services, social services.
Health Services	Doctors, hospitals, medical labs, etc.
New Economy Manufacturing	Electronic components, computers, optical equipment, semiconductors, etc.
Semiconductors	Called out due to the importance of semiconductors in Fremont. Defined as SIC 3674, which is only a portion of total semiconductor-related employment but is the most readily available proxy for the whole.
Traditional Manufacturing	All manufacturing not included in New Economy Manufacturing.
Public Administration	City and county government, schools, etc.
Software	SIC 7371, 7372, 7373, 7374, 7379.
Telecommunications	Telecommunications services and equipment. Many of the most dynamic firms are classified in the semiconductor industry or elsewhere in new economy manufacturing.
Wholesale Trade	Wholesale trade in all goods.
Other	Includes food processing, heavy industry (mining, refining, etc.), utilities, transportation, warehousing, distribution, broadcasting/media.

[3] For the purposes of this analysis the region is defined as the five counties that make up the core of the Bay Area: Alameda, Contra Costa, San Mateo, Santa Clara, and San Francisco.

Venture capital data are used to shed some light on Fremont's particular strengths and weaknesses in high-tech industries. While these data tend to confirm many of the conclusions drawn from employment data, they reveal some additional aspects of Fremont's performance.

Two different sources of employment data are used, California Employment Development Department (EDD) figures and Dun & Bradstreet data. Each of these sources has advantages and disadvantages. EDD data are used herein to examine trends over time, while Dun & Bradstreet data are used to look at the geographic distribution of jobs throughout the city. Although numbers from both sources are close, they are not equal. Therefore, in order to minimize confusion absolute numbers will only be presented when they come from EDD data; when Dun & Bradstreet data are presented, percentages will be used.

THE REGIONAL ECONOMY

REGIONAL TRENDS

Regional employment expanded by 21.5 percent from 1992 to 2000.[4] Table 2 shows the composition of the regional economy and growth during that period. The largest industry groups are retail and consumer services (21.1 percent of total), business services (21.0 percent) and public administration (13.5 percent). These three groups account for more than half of total regional employment.

The fastest-growing industry groups were software, which registered 270.5 percent expansion, construction, with 63.2 percent expansion, and new economy manufacturing, which grew by 35.8 percent. Business services and biotechnology also expanded more than total employment. These trends indicate the ongoing transformation of the regional economy, which is becoming increasingly based on high technology and advanced services.

Table 2: Composition of Regional Employment and Growth Trends

Industry Group	Employment		Growth, 1992-2000	Percent of Total	
	1992	2000		1992	2000
Biotechnology	49,472	62,430	26.2%	2.0%	2.1%
Business Services	488,661	639,531	30.9%	19.5%	21.0%
Construction	92,415	150,861	63.2%	3.7%	5.0%
Retail And Consumer Services	522,707	631,527	20.8%	20.9%	20.8%
Health Services	149,812	166,938	11.4%	6.0%	5.5%
New Economy Manufacturing	165,959	225,351	35.8%	6.6%	7.4%
Semiconductors	33,465	48,611	45.3%	1.3%	1.6%
Traditional Manufacturing	169,644	161,307	-4.9%	6.8%	5.3%
Public Administration	383,996	409,306	6.6%	15.3%	13.5%
Software	39,693	147,062	270.5%	1.6%	4.8%
Telecommunications	29,605	34,156	15.4%	1.2%	1.1%
Wholesale Trade	147,514	164,208	11.3%	7.4%	8.1%
Other	186,065	247,516	33.0%	5.9%	5.4%
TOTAL	2,501,956	3,040,190	21.5%	100%	100%

Source: California Economic Development Department, Strategic Economics.

[4] All EDD year 2000 employment data presented herein are based on an average of data from the first three quarters of 2000, not a full yearly average.

COUNTY TRENDS

Table 3 shows employment composition and growth in four of the five counties in the region. Alameda and Santa Clara counties are the two most relevant to Fremont given the city's location. Along with San Mateo, Santa Clara County registered the highest job growth in the region—28.3 percent between 1992 and 2000. Telecommunications and construction expanded the most. Interestingly, with the exception of telecommunications, growth in high-tech industry groups in Santa Clara County lagged behind regional rates, indicating decentralization of those industries. Nevertheless, the degree of decentralization varies significantly from industry to industry and Santa Clara County retains its dominance of high-tech industries.

Alameda County's employment base grew by nearly 20 percent, with software and new economy manufacturing leading the growth at 233.5 percent and 112.1 percent, respectively. Within new economy manufacturing, semiconductors grew by 622.8 percent. These figures indicate that Alameda County is capturing a significant share of the regional growth in high-tech industries.

High technology, or information-based industries, account for roughly 14 percent of total regional employment, up from only about 10 percent in 1992. The three information-based industry groups (new economy manufacturing, software, and biotechnology) show different locational patterns at the regional level. Table 4 shows each county's share of the high-tech industries.

New economy manufacturing, the largest of the three, is highly concentrated, with nearly 82 percent of the total jobs in Santa Clara County. Of the remaining counties, only Alameda County has a significant concentration, with roughly 12 percent. San Mateo's share has dropped in the last several years, meaning that the industry is becoming even more concentrated in Santa Clara County and Alameda County.

The semiconductor industry, which is included in new economy manufacturing, is even more highly concentrated than the industry group as a whole. Santa Clara County is home to fully 90 percent of the region's employment in SIC 3674.[5] The only other county to gain a foothold is Alameda County, which contains virtually all the rest. Most of Alameda County's employment in this category is concentrated in Fremont. Interestingly, even San Mateo County has not captured significant growth in the semiconductor industry.

Software, the next-largest of the information-based industries, is far less centralized, although the largest concentration is still found in Santa Clara County. Santa Clara County also posted the most significant absolute growth in software employment, even though the industry has grown in all five counties. San Mateo county has shown the highest growth in proportional terms, and the second-highest in absolute terms, and now occupies second place in terms of the overall size of software industry. Alameda County is now home to the third-highest concentration of software jobs in the region. Perhaps the largest grouping in Alameda County is in the Tri-Valley area, with roughly 8,000 software jobs. Software is the only high-tech industry in which San Francisco has captured a significant portion of regional activity.

Like software, biotechnology is quite decentralized, although it too has its largest concentration in Santa Clara County. Alameda County and San Mateo County share most of the rest, and San Francisco has a small but not insignificant share that may grow with the development of Mission Bay.

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[5] SIC 3674 is used as a proxy for the entire semiconductor industry. Some semiconductor-related employment is classified in SIC 3559, SIC 3825, and other categories.

Table 3: Growth Trends and Composition of Selected Counties

	Alameda		Contra Costa		Santa Clara		San Mateo	
	Growth	% of Total	Growth	% of Total	Growth	% of Total	Growth	% of Total
Biotechnology	42.9%	2.0%	9.7%	0.6%	11.0%	2.9%	62.6%	3.4%
Business Services	21.5%	14.9%	22.8%	21.6%	57.6%	17.3%	52.6%	20.5%
Construction	57.3%	5.5%	47.0%	7.7%	75.4%	4.7%	73.8%	5.3%
Retail And Consumer Services	11.6%	21.1%	13.8%	25.4%	25.4%	18.1%	19.0%	21.6%
Health Services	19.6%	6.8%	2.6%	7.6%	12.5%	4.8%	15.0%	5.2%
New Economy Manufacturing	112.1%	4.0%	-5.4%	0.8%	28.8%	17.9%	45.6%	2.5%
Semiconductors	622.8%	0.7%	0.0%	0.0%	40.9%	4.3%	-16.5%	0.0%
Traditional Manufacturing	4.2%	7.0%	-27.8%	3.4%	-15.1%	5.5%	30.6%	4.8%
Public Administration	-4.1%	17.3%	213.0%	14.7%	14.1%	10.3%	2.9%	8.7%
Software	233.5%	3.0%	247.5%	2.4%	34.0%	6.8%	719.1%	8.2%
Telecommunications	-5.6%	1.0%	5.6%	2.8%	213.3%	0.6%	70.1%	0.9%
Wholesale Trade	35.6%	9.4%	-8.6%	9.5%	19.4%	5.5%	-13.3%	5.4%
Other	27.9%	8.0%	-3.3%	3.6%	47.7%	5.5%	172.0%	13.5%
TOTAL	19.6%	100%	14.8%	100.0%	28.3%	100%	28.5%	100.0%

Source: California Employment Development Department, Strategic Economics.

Table 4: County Shares of High-Tech Industries, 2000					
Industry Group	Alameda	Contra Costa	Santa Clara	San Francisco	San Mateo
Software	14.0%	5.4%	47.4%	12.2%	21.0%
New Economy Manufacturing	12.2%	1.2%	81.6%	0.7%	4.2%
Semiconductors	9.4%	0.1%	90.0%	0.1%	0.3%
Biotechnology	22.1%	3.3%	47.8%	6.5%	20.3%
Source: California Employment Development Department, Strategic Economics.					

THE FREMONT ECONOMY

Table 5 shows the composition and growth of Fremont's employment. Fremont posted very strong employment growth over the period 1992 to 2000, adding nearly 36,000 net jobs, a 61.4 percent expansion—significantly more than either Alameda County or the region. Health services and retail and consumer services are noteworthy for their stagnation compared to most other industry groups, although they are not far out of step with Alameda County or the region Of the remaining industry groups, the only one that grew more slowly in Fremont than in Alameda County or the region was construction.

Table 5: Composition and Growth of Fremont's Economy				
Industry Group	Employment 1992	Employment 2000	Growth	% of Total
Biotechnology	379	2,075	447.4%	2.2%
Business Services	8,166	13,831	69.4%	14.8%
Construction	3,973	5,806	46.1%	6.2%
Retail And Consumer Services	14,557	16,735	15.0%	17.9%
Health Services	3,387	3,918	15.7%	4.2%
New Economy Manufacturing	7,548	17,590	133.0%	18.8%
Semiconductors	342	3,425	901.5%	3.7%
Traditional Manufacturing	4,878	7,847	60.9%	8.4%
Public Administration	6,347	7,065	11.3%	7.5%
Software	714	4,542	536.1%	4.8%
Telecommunications	263	458	74.1%	0.5%
Wholesale Trade	5,040	9,104	80.6%	9.7%
Other	2,797	4,696	67.9%	5.0%
TOTAL	58,050	93,667	61.4%	100.0%
Source: California Employment Development Department, Strategic Economics.				

Several industry groups stand out for their high growth rates. Three of these—software, biotechnology, and new economy manufacturing—are information-based industries. They grew by 536 percent, 447 percent, and 133 percent, respectively. Despite rapid growth, software and biotechnology still represent only a small part of Fremont's overall employment—only 7 percent combined. The mainstays of the city's job base are still business services, new economy manufacturing, and wholesale trade, retail and consumer services, and traditional manufacturing. All increased or maintained their share of total employment except for retail and consumer services.

Fremont's traditional industry groups continue to contribute significant shares of total employment growth even if their overall importance is decreasing. Table 6 shows each industry group's contribution

to net job growth. Business services, retail and consumer services, and traditional manufacturing together contributed 30 percent of Fremont's net job growth. However, software, a small and new industry group, contributed more net new jobs than traditional manufacturing, a larger and more established one. This fact is indicative of the extent to which Fremont's economy is increasingly connected to the information-based "new economy" industries. Roughly one quarter of the city's job base is now in new economy industry groups (biotechnology, new economy manufacturing, software, telecommunications) and these groups account for 44 percent of the jobs created between 1992 and 2000. However, even some of the traditional industry groups, notably business services and wholesale trade, are growing in large part because of their ties to new economy industry groups.

Table 6: Contribution to Net Job Growth in Fremont

Industry Group	Contribution
Biotechnology	4.8%
Business Services	15.9%
Construction	5.1%
Retail And Consumer Services	6.1%
Health Services	1.5%
New Economy Manufacturing	28.2%
Semiconductors	8.7%
Traditional Manufacturing	8.3%
Public Administration	2.0%
Software	10.7%
Telecommunications	0.5%
Wholesale Trade	11.4%
Other	5.3%

Source: California Employment Development Department, Strategic Economics.

The star industry group in Fremont is clearly new economy manufacturing, which expanded by 133 percent from 1992 to 2000, accounting for 28.2 of Fremont's total employment growth during this period and coming to represent 18.8 percent of the city's total employment. Although some other industry groups grew more quickly, they account for a much smaller portion of the city's total economy and overall growth.

Fremont's new economy manufacturing employment is extremely concentrated in just a few SIC categories. Semiconductors stand out as the single most important component of this industry group. In addition to SIC 3674 (semiconductors in the most limited definition), which contains roughly 20 percent of the total new economy manufacturing employment, SIC 3559 and SIC 3825 contain significant semiconductor-related employment. The semiconductor industry as a whole—when defined as broadly as possible—is even larger than indicated by the SIC codes examined above. According to calculations by the city, there are roughly 137 firms involved in the industry, with a total of over 10,000 employees. This means that as much as 10 percent of Fremont's employment is directly tied to the semiconductor industry.[6]

[6] This broader definition includes firms in a number of other SIC categories, including SIC 1799 (special trade contractors, NEC), 8731 (commercial physical/biological research), 7389 (business services, NEC) among others. These firms play a variety of roles in the industry, from providing clean room engineering and construction services to warehousing and transportation of semiconductors and related items. Most of the semiconductor-related

It is important to note that even many traditional industry groups are tightly bound up with the new economy. By some estimates, as much as one half of Fremont's total employment is connected directly to high technology, even in such industry groups as warehousing and retail trade. The wholesaler dealing in computer parts, the retailer selling cellular phones, and the warehousing and distribution operation that handles the inputs used to manufacture printed circuit boards—not to mention legal, financial, and other advanced business services—are all part of the high-tech economy.

This fact has important implications for understanding the growth of the economy and for planning how to accommodate that growth, since a wide range of supporting activities are necessary for high-tech industries to prosper.

FREMONT IN THE REGION

An examination of Fremont's role within the regional economy is crucial to understanding the city's strengths and weaknesses and to formulating future policy. This section examines the performance of industry groups in Fremont relative to other parts of the region using two main measures: employment trends and venture capital investments.

EMPLOYMENT TRENDS

Employment is the most readily available proxy for economic performance. This section compares employment trends in Fremont to the region as a whole. Table 7 shows Fremont's share of total employment in each industry group, a location quotient[7] indicating the city's degree of specialization, and a "competitiveness rating" developed by Strategic Economics. The system uses local (city-level) and regional employment trends to assign one of six different ratings to an industry group: *Strong*, *Stable*, *Emerging*, *Weak*, and *Declining*. The Technical Appendix provides more details.

Fremont's performance compared to the region was very strong from 1992 to 2000. The city grew significantly faster than the region, thereby increasing its share of county and regional employment in all industry groups except construction and health services. Six industry groups received a competitiveness rating of strong (or strong/emerging) and one was classified as emerging. Three received a rating of weak.[8]

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employment in Fremont is connected to semiconductor equipment, design, and services rather than to the manufacture of chips themselves.

[7] A location quotient is a simple measure of concentration that compares an industry group's share of total employment in the economy being analyzed to its share in a larger reference economy (in this case the county or the region). A location quotient greater than one means that Fremont has a higher concentration or "specialization" in that industry group; a number less than one means the opposite.

[8] In the case of traditional manufacturing, the rating was assigned despite healthy growth in Fremont because of stagnation and decline in this industry group at the regional level. The rating system developed by Strategic Economics incorporates regional as well as local performance. An industry will not be judged to be strong if it is declining at the regional level because it is assumed to provide limited potential for long-term growth. See the Technical Appendix for more details.

Table 7: Fremont's Place in the Regional Economy, 2000

	% of County	Location Quotient (County)	% of Region	Location Quotient (Region)	Competitiveness Rating (Region)
Biotechnology	15.1%	1.12	3.3%	1.08	Strong/ Emerging
Business Services	13.4%	0.99	2.2%	0.70	Strong
Construction	15.1%	1.12	3.8%	1.25	Weak
Retail And Consumer Services	11.4%	0.85	2.6%	0.86	Stable
Health Services	8.3%	0.61	2.3%	0.76	Weak
New Economy Manufacturing	63.9%	4.74	7.8%	2.53	Strong
Semiconductors	74.6%	5.53	7.0%	2.29	Strong
Traditional Manufacturing	16.1%	1.20	4.9%	1.58	Weak
Public Administration	5.9%	0.44	1.7%	0.56	N/A
Software	22.1%	1.64	3.1%	1.00	Strong
Telecommunications	6.5%	0.48	1.3%	0.44	Emerging
Wholesale Trade	16.4%	1.22	5.5%	1.80	Strong
Other	7.2%	0.53	1.9%	0.62	N/A
TOTAL	13.5%	1.00	3.1%	1.00	N/A

Source: California Employment Development Department, Strategic Economics.
Note: Competitiveness rating is not relevant to public administration because this is not a category of employment in which cities "compete" with other cities to attract jobs.

Fremont has a location quotient greater than one in biotechnology, construction, new economy manufacturing, traditional manufacturing, wholesale, and biotechnology. Four of these industry groups have a rating of strong, while two—construction and traditional manufacturing—are weak. Overall, this indicates that most of the industry groups in which the city is specialized (or specializing) are performing well.

Biotechnology has emerged as an increasingly important industry group within Fremont despite the fact that it still represents only 4.8 percent of the city's total employment. Rapid growth has given Fremont's biotech industry an increasingly high profile at the regional level. Fremont's location quotient in biotechnology is now greater than one, something not true as recently as 1998.

Both consumer services and business services received competitiveness ratings of strong. These industry groups are experiencing healthy growth at the regional level, and Fremont has captured a significant amount of that growth. They are likely to continue to grow, even if they account for a decreasing share of Fremont's total employment.

VENTURE CAPITAL INVESTMENTS

Venture capital (VC) investments can serve as an additional measure of the performance of some industry groups, and can shed additional light on Fremont's strengths and weaknesses. Total VC investments in Fremont have increased dramatically over the last few years, from about $124 million in 1997 to $472 million in 1999 and $543 million in the first three quarters alone of 2000.[9]

[9] The data presented in this section were taken from PricewaterhouseCoopers Moneytree. Although the surveys used to collect this information are almost certainly incomplete, these numbers do serve as useful and important

Table 8 shows the volume of Fremont's investments in each sector compared to Santa Clara County.[10] Because of definitional differences, the industries that appear in the table are not directly comparable to the industry groups defined earlier. However, it is assumed that the definitions are close enough that these figures serve as valid indicators of activity in biotechnology, software, and semiconductors.

Communications, software & information, and semiconductors & equipment are the most important recipient sectors in Fremont. This coincides with the industry groups experiencing most employment growth, given that most investments in the "communications" sector correspond to new economy manufacturing in the employment data. In Santa Clara County, the biggest recipients are software & information and communications, with business services and networking and equipment the next largest (in dollar terms) but trailing far behind.

A comparison of Fremont's investments with those of Santa Clara County sheds additional light on Fremont's competitive advantage. Table 9 shows the overall volume of investments in Fremont compared to Santa Clara County. Note that these figures should be interpreted as ratios, not as proportions, since Fremont's investments are not included in Santa Clara County. Table 10 shows average investment size by sector in Fremont and Santa Clara County, and Table 11 looks at the prevalence of early and late investments in each sector.

Biotechnology, communications, consumer products, and semiconductors all received more investments than would be expected given the volume of Fremont's total investments. For example, although Fremont's total investments represent only about 7 percent of the volume in Santa Clara County, investments in biotech represent one quarter of the level when measured by number of investments and one third when measured by total funds.

Moreover, as shown in Table 10, the average investment size in biotechnology, semiconductors, and consumer products was higher in Fremont than in Santa Clara County. Only in the case of consumer products can this potentially be explained by a greater proportion of later-stage investments that would presumably skew Fremont's average. Biotechnology and semiconductor investments seem to be more tilted towards early-stage investments in Fremont than in Santa Clara County. In the case of communications, average investment size lags slightly behind Santa Clara County despite an apparently greater prevalence of later-stage investments.[11]

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indicators of recent activity in high-tech industries. The quantitative data have been supplemented by interviews with venture capitalists and high-tech firms.

[10] For a variety of reasons related to data constraints, this section compares Fremont to Santa Clara County rather than to the five-county region. Although Fremont is not a part of Santa Clara County, this was considered a more revealing comparison.

[11] Early investments are defined as initial/seed and first-round investments. Late investments are defined as all others (bridge, mezzanine, second and later rounds, etc.).

Table 8: Venture Capital Investments in Fremont and Santa Clara County

	Fremont				Santa Clara County			
	Number		Value		Number		Value	
Sector	#	Percent	$	Percent	#	Percent	$	Percent
Biotechnology	6	4.8%	$110,913,998	8.3%	24	1.4%	$333,249,500	1.8%
Business Services	7	5.6%	$102,900,000	7.7%	132	7.8%	$1,918,004,200	10.3%
Communications	41	32.5%	$426,946,650	31.9%	323	19.0%	$3,931,588,617	21.2%
Computers & Peripherals	8	6.3%	$66,520,002	5.0%	101	5.9%	$858,146,000	4.6%
Consumer	5	4.0%	$56,500,000	4.2%	27	1.6%	$229,890,000	1.2%
Electronics & Instrumentation	6	4.8%	$119,200,000	8.9%	79	4.7%	$534,271,137	2.9%
Medical Instruments & Devices	4	3.2%	$31,832,000	2.4%	86	5.1%	$745,009,000	4.0%
Networking & Equipment	5	4.0%	$52,278,202	3.9%	72	4.2%	$1,752,585,505	9.4%
Semiconductors/Equipment	16	12.7%	$237,829,000	17.8%	96	5.7%	$926,855,609	5.0%
Software & Information	20	15.9%	$69,416,500	5.2%	660	38.9%	$5,828,175,855	31.4%
Other	8	6.3%	$62,633,334	4.7%	98	5.8%	$1,500,064,536	8.1%
Total	126	100.0%	$1,336,969,686	100.0%	1698	100.0%	$18,557,839,959	100.0%

Source: PricewaterhouseCoopers Moneytree

Table 9: Fremont Investments as Percentage of Santa Clara County

Sector	#	$
Biotechnology	25.0%	33.3%
Business Services	5.3%	5.4%
Communications	12.7%	10.9%
Computers & Peripherals	7.9%	7.8%
Consumer	18.5%	24.6%
Electronics & Instrumentation	7.6%	22.3%
Medical Instruments & Devices	4.7%	4.3%
Networking & Equipment	6.9%	3.0%
Semiconductors/Equipment	16.7%	25.7%
Software & Information	3.0%	1.2%
Other	8.2%	4.2%

Source: PricewaterhouseCoopers Moneytree

These numbers suggest that Fremont has a competitive advantage in these sectors and is considered a desirable location at the regional level for biotech and semiconductor firms. This interpretation is supported by the employment data presented above. Biotechnology and semiconductors both received a rating of strong due to their high rate of employment growth vis-à-vis the five-county region.[12]

Biotechnology in particular seems to be clearly capturing more and larger investments than would be expected given Fremont's overall venture capital performance, and there is a high number of early-stage investments compared to both other sectors in Fremont and to biotech investments in Santa Clara County, indicating that Fremont is a desirable location for young biotech firms and start-ups. The number of investments is small so this conclusion should be viewed with caution. However, one piece of supporting evidence is the much faster rate of proliferation of biotech firms in Fremont compared to Santa Clara County. From 1992 to 1999 the number of firms in Santa Clara County expanded by less than 50 percent, from 502 to 725, while the number of firms in Fremont nearly quadrupled, from 16 to 59, suggesting a higher rate of start-up activity.

Semiconductor firms are also capturing more and larger investments than would be expected on the basis of overall venture capital investment. This is not surprising given the rapid growth in this industry group during the 1990s. It is unclear whether there is a significant difference between Fremont and Santa Clara County in the amount of money invested in early and late stages. Nevertheless, the venture capital data confirm the strength of this industry in Fremont.

In contrast to biotechnology and semiconductors, software is notable for the relative lack of investments in Fremont. Although software firms received an important share of Fremont's total VC investments, Fremont attracted only 3 percent of Santa Clara County's level of investment in terms of number of investments, and only 1.2 percent in terms of funds. This suggests that software is underperforming in Fremont. In this case the venture capital data seem at odds with employment data, which suggest that Fremont's software industry is in fact performing well.

Closer analysis reveals two reasons that Fremont's software industry may show higher employment growth than venture capital investment. First, a very high percentage of Fremont's software employment is in very small firms. The average number of employees in Fremont software firms is 11, in Santa Clara firms 19. The small, often home-based firms that make up a significant portion of Fremont's software industry are much less likely to receive venture capital than other firms. Therefore, despite the rapid growth of software employment in Fremont, the city has registered relatively few VC investments.

Second, the average venture capital investment in software companies in Fremont is significantly smaller than in Santa Clara County. This is due in part to the greater prevalence of early-stage investments in Fremont-based software companies. Roughly 35 percent of Fremont's software VC investments were early-stage, compared to 25 percent in Santa Clara County. Early-stage investments are generally smaller than later-stage investments.

These data seem to suggest that Fremont is a more attractive place to start a software company than to expand one, and that the conditions for significant growth in the software industry are not present. Although the quantitative data are too sparse to say this with a high degree of confidence, anecdotal evidence seems to support this conclusion.

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[12] Note that the definitions of the industries used in the employment analysis differ somewhat from those used in the venture capital analysis. Therefore, this should be viewed as a general, qualitative comparison. The definition of telecommunications in the employment data differs too much from the definition of communications in the venture capital data to even permit such a general comparison.

Table 10: Average Investment Size, Fremont and Santa Clara County

Sector	Fremont	Santa Clara County
Biotechnology	$18,485,666	$13,885,396
Business Services	$14,700,000	$14,530,335
Communications	$10,413,333	$12,172,101
Computers & Peripherals	$8,315,000	$8,496,495
Consumer	$11,300,000	$8,514,444
Electronics & Instrumentation	$19,866,667	$6,762,926
Medical Instruments & Devices	$7,958,000	$8,662,895
Networking & Equipment	$10,455,640	$24,341,465
Semiconductors/Equipment	$14,864,313	$9,654,746
Software & Information	$3,470,825	$8,830,569
Other	$7,829,167	$15,306,781
Total	$10,610,871	$10,929,234

Source: PricewaterhouseCoopers Moneytree

Table 11: Comparison of Early and Late Investments in Selected Sectors

Sector	Value of Investments ($) / Number of Investments	Early		Late		Not Categorized	
		Fremont	San Jose	Fremont	San Jose	Fremont	San Jose
Biotechnology	Value	40.3%	12.2%	59.7%	82.1%	0.0%	5.8%
	Number	50.0%	20.8%	50.0%	66.7%	0.0%	12.5%
Business Services	Value	20.7%	18.6%	73.0%	73.3%	6.3%	8.0%
	Number	42.9%	33.3%	42.9%	57.6%	14.3%	9.1%
Communications	Value	6.6%	17.1%	88.6%	77.7%	4.8%	5.3%
	Number	14.6%	29.1%	73.2%	60.7%	12.2%	10.2%
Computers & Peripherals	Value	12.8%	10.7%	87.2%	79.3%	0.0%	10.0%
	Number	37.5%	21.8%	62.5%	67.3%	0.0%	10.9%
Consumer	Value	0.0%	15.2%	100.0%	81.3%	0.0%	3.5%
	Number	0.0%	33.3%	100.0%	48.1%	0.0%	18.5%
Networking & Equipment	Value	19.1%	18.6%	80.9%	80.1%	0.0%	1.3%
	Number	20.0%	37.5%	80.0%	56.9%	0.0%	5.6%
Semiconductors/Equipment	Value	9.2%	10.1%	64.9%	84.4%	25.9%	5.5%
	Number	25.0%	15.6%	56.3%	68.8%	18.8%	15.6%
Software & Information	Value	32.0%	13.3%	58.9%	78.1%	9.1%	8.6%
	Number	35.0%	24.2%	55.0%	65.0%	10.0%	10.8%
Total	Value	12.2%	14.2%	78.8%	77.8%	9.0%	8.0%
	Number	23.0%	25.2%	65.9%	63.4%	11.1%	11.4%

Source: PricewaterhouseCoopers Moneytree
Note: Early investments defined as initial/seed and first-round investments. Late investments defined as all others (bridge, mezzanine, second and later rounds, etc.).

Although Fremont's investments overall show the same division between early and late investments as those in Santa Clara County, in Fremont's three largest recipient industries—communications, semiconductors, and software—some significant differences emerge.[13] Specifically, communications shows a greater tendency to receive late-stage investments in Fremont than in Santa Clara County. Software and semiconductors, in contrast, receive more early-stage investments in Fremont than in Santa Clara County.

Although the city is host to many start-up firms in the semiconductor industry, most of the growth is explained by the expansion of existing firms. Table 12 shows trends in several industry groups.[14] The number of firms in the new economy manufacturing industry group nearly doubled, semiconductor firms tripled, and software firms more than quadrupled. The increase in the number of software firms is on par with the increase in software employment. However, semiconductor employment grew by far more than the number of semiconductor firms, indicating that semiconductor firm size is growing much more than software firms. Average firm age in the software industry group is six years, compared to nine years in high-tech manufacturing and 10 years in semiconductors, indicating a higher proportion of young firms in the software industry.

Table 12: Trends in Number of Establishments and Number of Employees

Industry Group	Firms 1992	Firms 1999	Increase, # of Firms	Increase, Employment	Average Firm Age, 2000
New Economy Manufacturing	124	236	90%	105%	9
Semiconductors	10	33	230%	909%	10
Software	68	296	335%	358%	6

Source: California Employment Development Department, Dun & Bradstreet, Strategic Economics.

FREMONT, HIGH TECH, AND THE REGION

Together, the employment and venture capital data suggest that communications firms are more likely to see Fremont as a good place to expand rather than as a good place to get started, biotechnology and semiconductor firms view Fremont as a good location at all stages of their life cycle, and primarily small, young software firms choose Fremont as a location. These software firms either stay small or move out of Fremont when they reach a certain size. Thus, Fremont's competitive position varies significantly from industry to industry.

By all measures, the semiconductor industry in Fremont is very strong. The dominance of Santa Clara County in the semiconductor industry means that Fremont's proximity to the heart of the industry, combined with lower cost of business, makes it a desirable location for certain types of firms in this industry, namely price-sensitive firms that require relatively low-cost flexible space.

The semiconductor industry appears set to experience healthy growth when the economy picks up steam again. Recent technical advances have helped make the future of the industry somewhat more predictable. Intel recently announced that it has made semiconductors with switches that are both smaller and more energy-efficient than any others to date, paving the way for several future generations of fast

[13] Other sectors in Fremont have simply received too few investments to show a discernable pattern.

[14] Note that these figures are based on employment data and the industry groups are therefore not directly comparable to the sectors presented in the venture capital investment data. Nevertheless, they are broadly comparable.

and powerful sub-.13 micron chips. Most importantly, these chips will be made with standard techniques and materials, a fact which eliminates concerns that the semiconductor industry is running up against limits in its push to create the next generation of chips. This also means that the kind of profound changes in the industry that might be driven by a major technological shift—and that might drive the locus of the industry to some other region of the world—will not occur in the near future. The semiconductor industry will experience several new growth cycles and the industry's key players are positioned to retain their dominance for some time to come. Because of Fremont's proximity to the heart of the industry and the fact that it is home to many firms that are leaders in the current semiconductor technologies, the future of the industry bodes well for Fremont.

While Fremont's competitive position in this industry is strong, it is by no means assured. The Tri-Valley has seen increasing activity in the semiconductor industry as firms have been attracted to its high-quality affordable commercial real estate. Although the semiconductor labor force has traditionally been concentrated very close to the heart of Silicon Valley, high housing costs close to Silicon Valley have led to changes in the region's residential patterns, so semiconductor firms can now more easily find workers in the Tri-Valley area. As a result, some less location-sensitive semiconductor firms—or divisions of firms—are finding that the Tri-Valley area meets their needs as well as or better than Fremont. For example, KLA-Tencor has acquired space in Livermore, in part to tap into the local labor pool.

A similar dynamic characterizes new economy manufacturing in general, although the labor force is not necessarily as specialized in all branches of this industry group as in semiconductors, making decentralization more feasible. As the cost of doing business continues to rise in Silicon Valley and Fremont, a restructuring of new economy manufacturing can be expected, with more space-intensive activities moving out of the heart of Silicon Valley and even out of the region altogether. This trend is apparent in the departure of some prominent firms in this industry group, such as Flextronics.

This represents a restructuring similar to that which has occurred in the semiconductor industry. Most semiconductor manufacturing left Silicon Valley years ago; the activities that remain are high-end engineering and equipment design.[15] Just as Fremont has attracted (and will continue to attract) some of the more sophisticated pieces of the semiconductor industry, so it should create the conditions for a continual upgrading of its role in other new economy manufacturing industries. As firms bump up against the constraints of space and cost in the heart of Silicon Valley, Fremont will be able to capture some of the growth even as it loses some lower-end firms and functions.

Already many firms in the new economy manufacturing group in Fremont are seeking real estate with a high percentage of office and R&D space as they engage in higher-level activities in Fremont and do manufacturing farther from Silicon Valley. If costs continue to rise in the next economic cycle then manufacturing will become even less viable in close proximity to Silicon Valley, and it is likely that other new economy manufacturing firms will depart or shed certain functions. Firms like Flextronics that focus on manufacturing may simply find that Fremont does not meet their needs. However, other new economy "manufacturing" firms that do less manufacturing on-site may will continue to locate there for the same reasons they do now: proximity to Silicon Valley and relatively low cost, as well as Fremont's other assets.

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[15] Semiconductor manufacturing *per se*, i.e. the actual production of chips, is not the most sophisticated part of the industry. Because they are space intensive and do not need to be at the center of innovation, semiconductor "fabs" (factories) have moved to second-tier locations around the country and the world. The truly innovative parts of the industry—designing ever-more-complex chips and the machines that make them—have for the most part remained in Silicon Valley in order to have access to the talent, infrastructure, and information that is concentrated there.

Thus, the departure of individual firms should not be viewed as particularly worrying. Fremont's competitive position will change with the dynamics of the region as a whole and of particular industries, but the city should remain attractive to firms in its key industry groups as long as it focuses on maintaining and building its assets. This includes keeping abreast of the changing real estate needs of new economy manufacturing firms as they restructure and choose to locate different activities in Fremont.

Fremont's growing strength in biotechnology is due in part to geography. Not only does Fremont's proximity to Santa Clara County confer a similar advantage in biotech as in new economy manufacturing, but the relative accessibility via the Dumbarton Bridge to San Mateo County and San Francisco adds to the attraction of the location. Lower real estate prices prove the final draw for many firms. Much of the biotech growth has occurred in the Ardenwood area near the Dumbarton Bridge, a location that allows easy access to the labor force and institutions of the entire region.

In software, Fremont's position is much less competitive. Although Fremont has posted strong growth in software employment, it contains a much smaller proportion of both Alameda County's total software employment and total regional software employment than it does semiconductor employment. Data on venture capital investments also indicate that Fremont is not a top choice as a location for software companies.

The greater dispersion of the software industry indicates that on the whole software companies are less location sensitive. In reality, the pattern varies greatly depending on the type of software firm. Business service software firms are quite price sensitive and are responsible for the majority of the employment growth in the Tri-Valley area. They are attracted to the relatively low prices for high-end office space and the growing resident labor pool in the Tri-Valley and beyond in Tracy. Anecdotal evidence suggests that the type of worker these firms require is more likely to live outside the bounds of Silicon Valley.

Technical software companies (i.e. those that produce software used in semiconductor design and manufacturing, biotech, and so on) are generally less price sensitive and more location sensitive. For many the location of choice is in close proximity to the intersection of the 101 and 237 freeways. Such firms are generally highly profitable and willing to pay high prices to be in a prime location. Most would not consider Fremont their first choice of location because of its distance from that location.

As noted earlier, although start-up employment in software has increased in Fremont, the city does not appear to be capturing much growth in later-stage firms. It may be that software firms started in Fremont remain small, or that they leave Fremont when they reach a certain size. This can happen for a variety of reasons, including more appropriate real estate elsewhere or the locational dynamics of particular niches within the software industry. For example, Everest, a firm that produced software for the semiconductor industry, was started by an entrepreneur living in Fremont. When it was purchased by Synopsys the company moved its facilities to Sunnyvale, considered a prime location for that segment of the industry because of the concentration of firms there.

Thus, Fremont does not appear to be in a position to capture either the high-end software growth that does not tend to decentralize readily or the more price-sensitive software growth that is prepared to move away from the heart of Silicon Valley.

With this background on Fremont's current position in the region, we can now turn to a brief overview of the city's main assets. This will help explain why Fremont is strong in the areas where it has done well and also lay the foundation for an understanding of what the city must do in the future to maintain its strengths and develop new ones.

IV. FREMONT'S KEY ASSETS

DIVERSITY

Diversity—in the city's economy, population, and built environment—is a significant asset that can play an important role in Fremont's economic development by providing economic stability and an attractive environment for people and firms.

The recent economic downturn has shown that even high-growth industries can be susceptible to severe job losses. This illustrates the desirability of having a diverse economic portfolio. Fremont has a broad base of strong industry groups and is likely to fare better in terms of employment than cities that are more specialized.

Fremont also has significant demographic diversity, to be discussed in more detail below—that has important implications for the city's economic development because it increases the number of talented people attracted to Fremont.

Finally, diversity in the city's built environment is crucial to attracting and maintaining a diverse population and economic base. A range of building types for different types of firms, diverse neighborhoods with individual identities, and a range of housing types all help the city provide options for many different types of businesses and people. Fremont can increase diversity in its residential choices, retail options, and commercial real estate. Notable gaps are pedestrian-oriented retail, retail serving specific ethnic markets, and smaller office spaces, particularly in the central business district (CBD).

EDUCATION

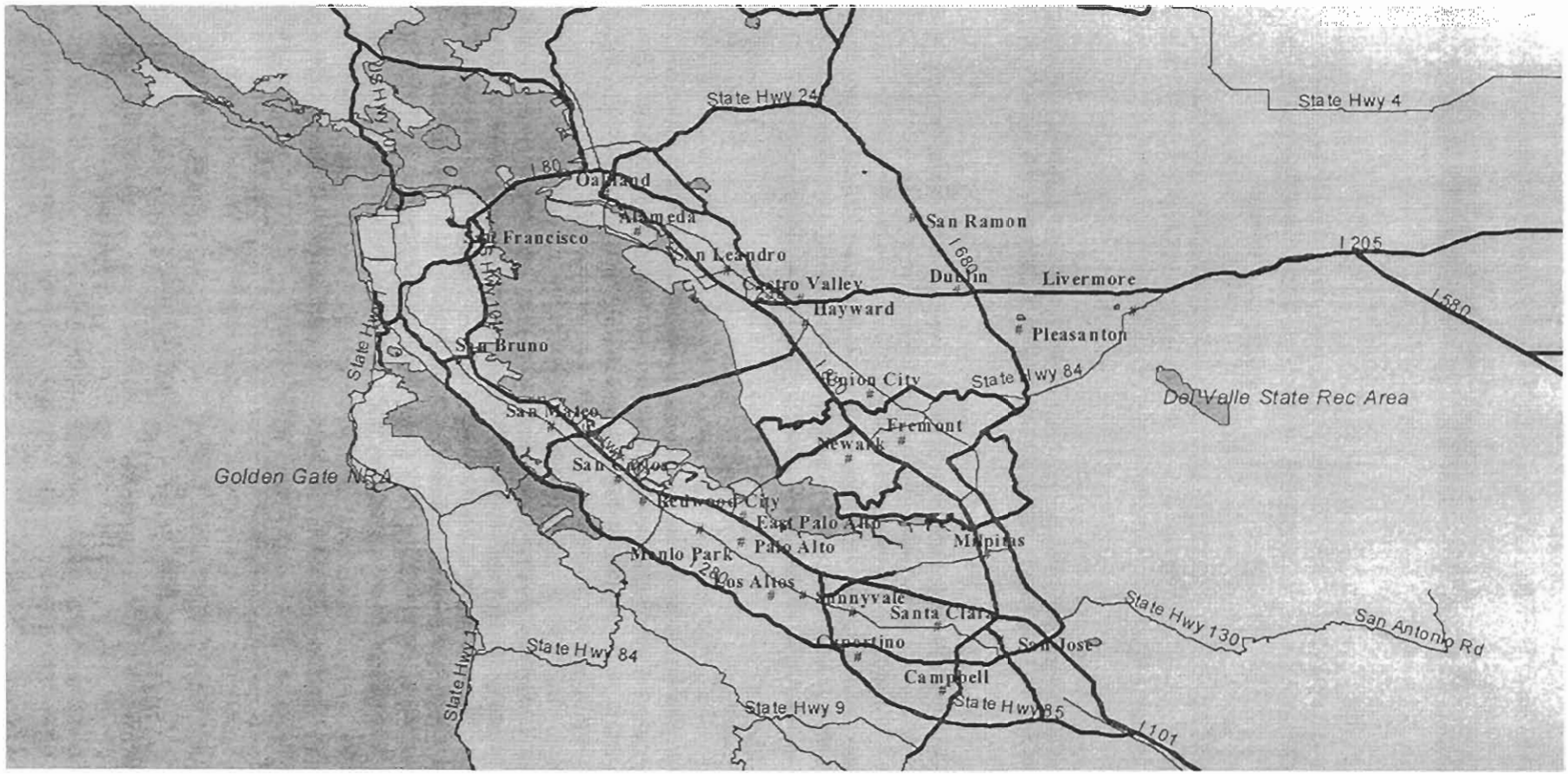
Schools are one of the main criteria that homebuyers use when selecting a community to live in. Fremont has the reputation of having a good educational system that serves a wide variety of students. This asset makes Fremont especially attractive to highly educated residents that contribute to the city's workforce and often start businesses close to home.

Fremont's schools are one of the most important economic development assets the city has. Although many, or even most of the graduates of the school system will ultimately work outside Fremont, the quality of the schools plays a key role in attracting their families to the city in the first place and creating the favorable demographics that Fremont enjoys.

GEOGRAPHY

As shown in Map 1, Fremont is well-positioned in the region, close to Silicon Valley but far enough from the core to have significantly more affordable real estate. For certain users that are both price-sensitive and distance-sensitive, Fremont is an ideal location.

As the region as a whole and individual industries evolve, the exact type of firm that finds Fremont's geography appealing will likely change. The city must ensure that its other assets evolve in such a way that the geographic advantage remains viable.



Sources: ESRI

Map 1: Fremont in the Region

Strategic Economics

0 10 20 30 Miles

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REAL ESTATE

Fremont's real estate prices are significantly below those in the heart of Silicon Valley, and the city has been able to supply enough high-quality real estate to keep up with growing demand. This has allowed the city to take advantage of its geographic location. However, there are some notable gaps, such as small office spaces and high-end retail spaces.

Until now, land supply has not been a problem in Fremont, but in order to continue to meet real estate demand the city will have to consider ways to use land more efficiently. Pacific Commons shows that higher-density development is economically viable.

Housing is an important part of the real estate picture. Assets such as diversity, demographics, and community quality are supported by a high-quality housing stock that offers a wide range of residential choices.

COMMUNITY QUALITY

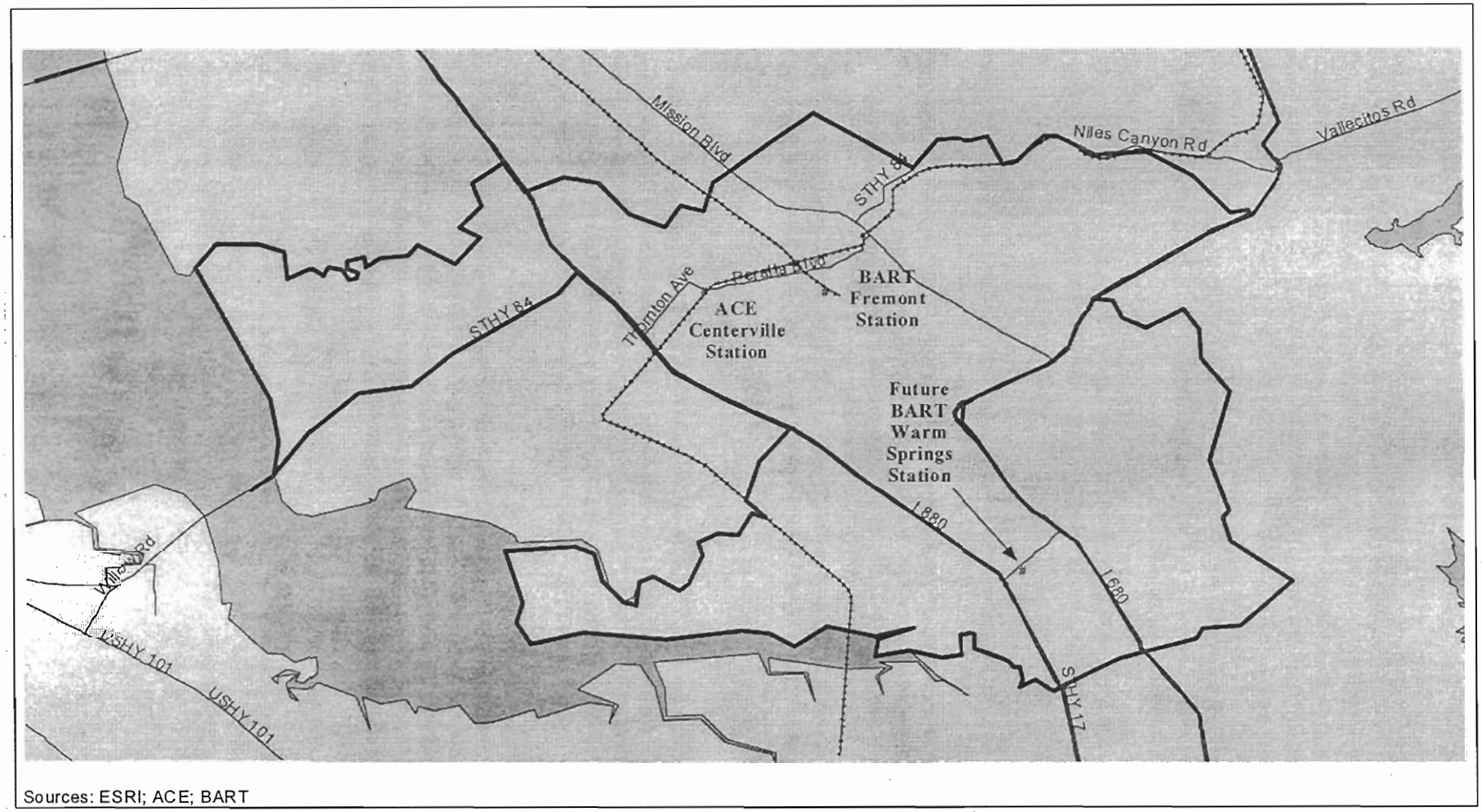
Fremont has become increasingly recognized as a desirable place to live. Good schools, high-quality housing, parks, and an environment receptive to a wide range of ethnic and religious groups have made Fremont a desirable location for many of the Bay Area's most talented and entrepreneurial residents.

Quality of life is an important factor in economic development, and these assets need to be maintained and expanded. Diverse, high-quality retail is perhaps the biggest gap in Fremont's quality of life assets.

TRANSIT

Fremont has significant transit infrastructure, with the prospect of more in the works. Fremont is connected to San Jose and the Tri-Valley by Altamont Commuter Express trains, and to the Oakland area, San Francisco, and the Tri-Valley by BART. BART may be extended to San Jose by 2010. Although the city's transit connections have played a minimal role to date in driving economic growth, they will likely be more important in the future. Map 2 shows the location of Fremont's main rail stations, including the future Warm Springs station.

The city should focus on better capitalizing on transit infrastructure through supportive land use and other policies. The last year has seen a significant leap forward in the commitment to build the BART extension to San Jose, including the Warm Springs station. The city's planning efforts should be commensurate with the status of the BART project. Specifically, denser development in the CBD would increase the value of Fremont BART station, and transit-oriented development around the Warm Springs station should be a priority.



Sources: ESRI; ACE; BART

Map 2: Fremont Transit Assets

Strategic Economics

0 1 2 3 4 5 Miles

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DEMOGRAPHICS

Fremont's residents are one of its key assets. The city has a highly skilled, educated, and largely prosperous labor force that attracts firms. Equally importantly, Fremont has a significant population of entrepreneurs, some of whom place high value on business locations near their homes. Fremont is also the center of the Bay Area's Indian and South Asian community, which has become an increasingly important force in entrepreneurship. Fremont also has an important concentration of Chinese and Chinese-American residents, many of whom are active entrepreneurs. and in close proximity to the ethnic networks that operate in the area.

Fremont has been growing rapidly over the last two decades. Up from a population of nearly 131,000 residents in 1980, the city is projected to have nearly 214,000 residents by 2005. Average annual growth of 2.8 percent from 1980 to 1990 outpaced 1.5 percent in Alameda and Santa Clara Counties, and doubled the Bay area rate of 1.4 percent per year. According to population estimates for the year 2000, Fremont's population continued to grow relatively quickly from 1990 to 2000, at 1.6 percent per year compared to 1.1 to 1.2 percent for the other areas. Growth over the next 5 years is projected to slow to a level comparable with the other counties and Bay Area.

Household incomes in Fremont are higher than those in Alameda County and the Bay Area as a whole, and roughly the same as in Santa Clara County. Year 2000 estimates show a median household income in Fremont of $77,230, as compared to $56,480, $78,060 and $64,800 for Alameda County, Santa Clara County, and the Bay Area, respectively.

Census data from 1990 indicate that Fremont has an educated population. Educational attainment is at higher levels than California as a whole and roughly comparable to the rest of the Bay Area. Fremont does have a slightly lower percentage of people with a graduate or professional degree, and a high percentage of persons with a Bachelor's. The city also shows a much lower percentage of persons who did not complete high school.

Fremont is very ethnically diverse, as shown in Table 13. Particularly noteworthy is the large Asian population, of which the two principal groups are people of Indian and Chinese origin. These two groups are very prominent in high-tech industries as both employees and entrepreneurs. Fremont is widely viewed as the cultural center of the Bay Area's Indian community. The presence of these groups in Fremont, along with the city's other highly skilled and talented residents, is a significant economic benefit.

Demographics have important implications for entrepreneurship and retail. Entrepreneurship depends on highly educated people, and the more such residents Fremont can attract, the more likely the city is to benefit from their activity. Many entrepreneurs prefer to start their businesses close to home, and in fact one of the best predictors of corporate location is the residence of the CEO.

Table 13: Racial and Ethnic Composition of Fremont's Population, 2000		
Race/Ethnicity	Number	% of Total
Total Population	203,413	100.0
White	96,968	47.7
Asian	75,165	37.0
Indian	20,742	10.2
Chinese	29,240	14.4
Two or more races	11,873	5.8
Black	6,310	3.1
Native American	1,048	0.5
Hawaiian, Pacific islander	819	0.4
Other race	11,230	5.5
Hispanic/Latino (any race)	27,409	13.5
Source: U.S. Census, 2000.		

Education and entrepreneurship are correlated to some degree with nationality and ethnicity. Many of Fremont's immigrants are highly educated people of Indian and Chinese origin who came to the U.S. to study or work in high technology. Because of their individual academic and professional backgrounds, members of these groups tend to be very involved in high-tech entrepreneurship. This is borne out by a look at the striking ethnic diversity and international flavor of Fremont's economy. In high tech alone, an analysis of the names of CEOs of the 1,118 high-tech firms listed in the Dun & Bradstreet database reveals the following:

- At least 30 percent of the CEOs are of Chinese descent. Note that this reveals nothing about place of birth or citizenship, and that many of them are native-born Americans. Nevertheless, research has shown that ethnic ties play a significant role in high tech and can be important regardless of citizenship or national origin.
- Roughly 8 percent of the CEOs are of South Asian (Indian/Pakistani) descent.
- Another 10 to 15 percent are from a wide variety of Asian backgrounds other than Chinese or South Asian. Most appear to be immigrants. Vietnamese, Japanese, Korean, Arabic, and Persian names all figure prominently in this group.
- The remainder—roughly 50 percent—are from a variety of ethnic backgrounds (other than those mentioned above) but appear to be primarily native-born Americans with no ethnic ties to the countries of the Asia/Pacific region.

Thus, by attracting a talented and diverse group of residents, Fremont is enhancing its own economic prospects.

Demographics also are important when considering the city's retail offerings. Many prosperous Fremont residents do much of their shopping elsewhere because of the relative lack of high-end offerings in Fremont. Also, the city's ethnic diversity means that the retail sector must cater to a wide variety of tastes in high-end and lower-end retail alike. The chapter on retail and sales tax will discuss this in more detail.

V. SPATIAL PATTERNS

In large part because of Fremont's origins as an amalgamation of separate communities, each of the city's neighborhoods has a unique character and plays a very different role in the city's economic life. As this chapter shows, jobs demonstrate a very high degree of concentration in just a few parts of the city that contain little residential development, while other parts of the city function primarily as residential neighborhoods.

Although the focus of this chapter is on the distribution of jobs among the city's different subareas, it is important to remember that residential neighborhoods are also part of the overall economic picture of the city. High-quality residential neighborhoods offering amenities and diverse housing choices help make Fremont a desirable place to live for a wide range of people. The city's resident labor force and entrepreneurial base is a significant factor in its economic success.

Physical planning should take into account the economic importance of all the city's neighborhoods, and the differences between them. Several sections of this report allude to the importance of creating a vibrant downtown, but place-making should not be limited to the CBD. Residential neighborhoods should also be treated as economic assets; efforts to endow them with unique identities and high-quality amenities enhance their ability to play an important economic role. Likewise, areas that are mainly employment centers can still offer amenities that set them apart from other places in the region, including specialty retail. Although the CBD is the most important location for place-making efforts aimed at attracting unique retail, other parts of the city offer good opportunities as well. In short, each neighborhood should be viewed as an opportunity for the city to create a unique, high-quality place for people to live, work, shop, recreate, or some combination of all four.

Map 3 shows the subareas (planning areas) used to analyze the spatial patterns of Fremont's employment.

EMPLOYMENT

Map 4 shows the distribution of Fremont's employment. The Industrial subarea contains nearly 60 percent of all the jobs in Fremont, and large firms accounting for significant employment are concentrated in only a few other parts of the city. However, Industrial's share of jobs varies greatly from industry group to industry group. Table 14 shows the distribution of employment in the different industry groups among Fremont's subareas. In some types of jobs this area's dominance is nearly unchallenged: it contains 85 to 90 percent of all employment in manufacturing—both traditional and new economy—and wholesale trade. In others, such as biotechnology, construction, semiconductors, software, and telecommunications, Industrial still contains the majority of employment but other subareas have significant shares. In the case of health services and public administration Industrial's share is insignificant.

Northern Plain, although it contains less than 5 percent of total employment, is the only other subarea that contains significant shares of the high-tech industries in which Industrial is not absolutely dominant, namely biotechnology, semiconductors, and to a lesser extent software. The Ardenwood area near the Dumbarton Bridge tends to attract biotech companies that are more oriented towards the peninsula and that labor market than towards San Jose.

Of the remaining subareas, the most noteworthy pattern is in Central, which is perhaps the most diverse of the subareas. Central contains roughly 12 percent of total employment, with significant shares of

business services, health services, consumer services and retail, software, and telecommunications. Central is clearly attracting wide range of commercial uses based in offices and retail space.

Maps 5 through 8 show the distribution of various industry groups. Clearly visible are the dominance of Industrial and Northern Plain in new economy manufacturing and biotechnology compared to the greater dispersion of software and business services, as well as the role played by Central in the latter two industry groups.

START-UPS

The location of start-up firms (firms five years old or younger) can provide insights into whether, and how, the employment patterns of the city are changing and where economic development efforts might be focused. Table 15 shows the geographic distribution of start-up firms in Fremont. The data show decentralization in some industry groups and little change in others.

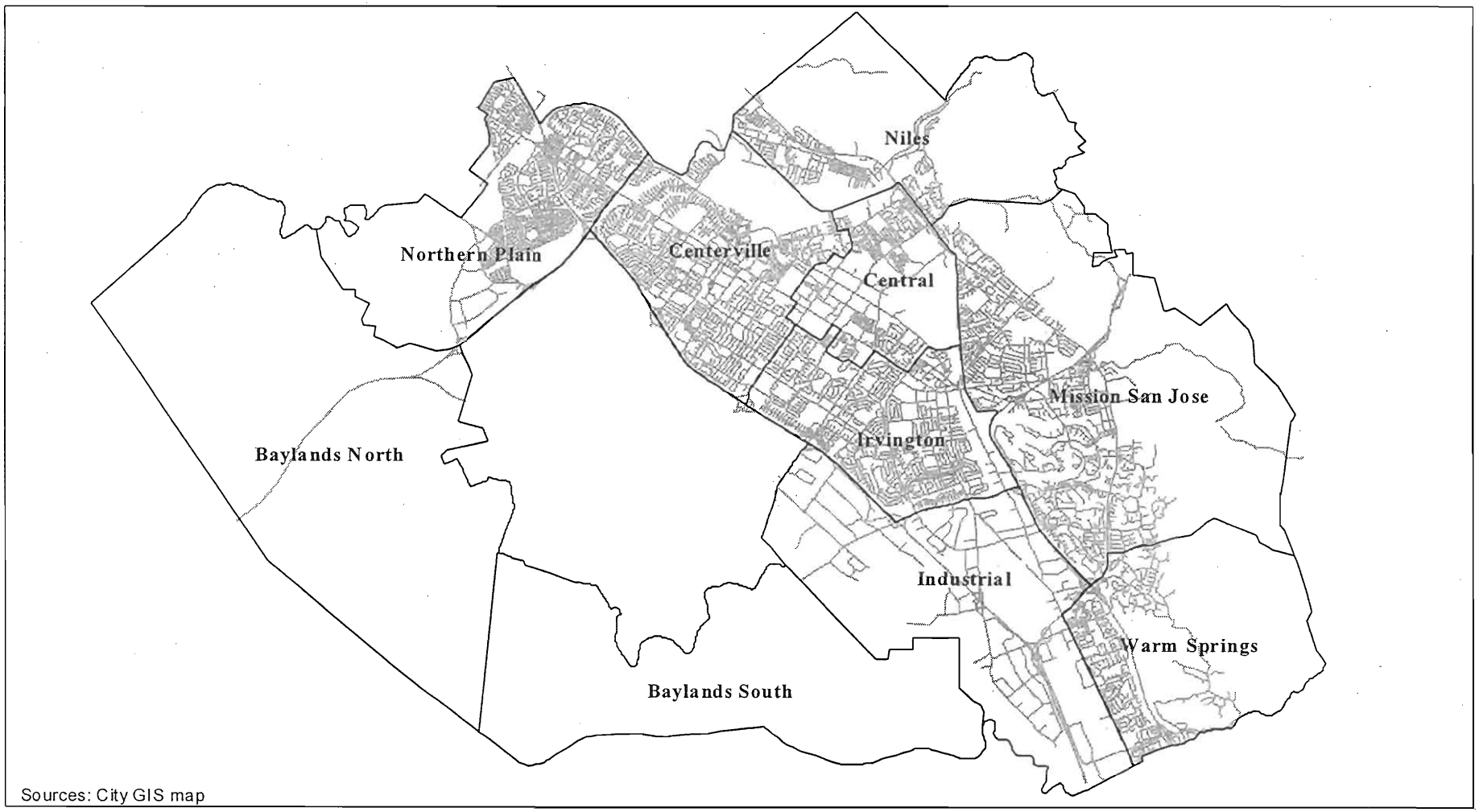
In biotechnology and new economy manufacturing (including semiconductors) there is little evidence of any change from the current pattern. Start-up firms and employment are distributed in roughly the same way as total employment in those industry groups.

Some of the industry groups in which the Industrial subarea dominates total employment show much larger shares of start-up employment in other subareas than might be expected. Industrial's share of start-up firms is particularly low in manufacturing, software, telecommunications, and wholesale. In most cases, however, manufacturing and wholesale firms located in Irvington, Mission San Jose, or Warm Springs are very close to the Industrial subarea and thus cannot be said to be decentralizing.

In the case of telecommunications and software, however, there does appear to be a definite pattern of decentralization. Software start-ups are much less concentrated than software employment as a whole. Industrial contains only about one quarter of Fremont's software start-ups, as opposed to nearly 70 percent of total software employment. This is due in part to the fact that, as mentioned earlier, many software firms in Fremont are small and find it easy to locate outside the main job centers, even in residential neighborhoods. However, this does not explain the entire difference, since Industrial's share of start-up software employment is less than its share of total software employment. This indicates that software employment in Fremont is decentralizing to some degree.

This phenomenon varies from subarea to subarea. Table 16 shows the average size of established and start-up software firms in the different subareas. Most of the subareas are home to only very small software firms, many of which are home based. Industrial contains the largest firms, 35 employees per firm among established firms and roughly 15 employees per firm in start-ups. Two subareas, Central and Northern Plain, fall in between.

These facts have important implications for future development in Fremont because they demonstrate that there is a particular type of firm—for example, medium-sized (by Fremont standards) software firms—that is not only willing to locate away from the main job centers but may in fact prefer such locations as long as they provide certain advantages. The Central subarea in particular appears to be increasingly attractive to software and telecom firms, and this trend could be strengthened by providing the type of space—i.e., appropriately sized office space at competitive prices—that this particular group of firm needs, as well as amenities such as good access to public transportation and an interesting urban environment.



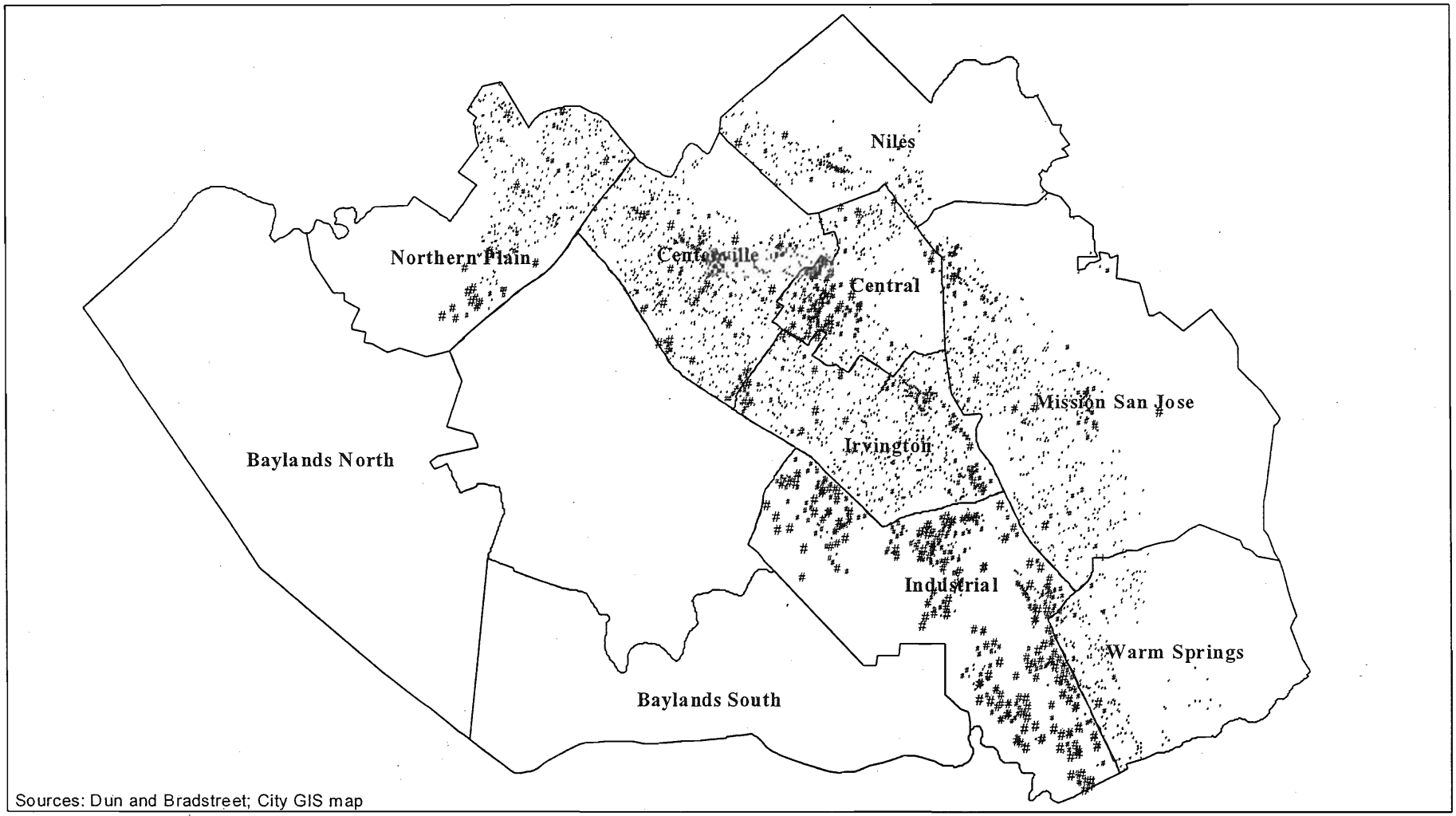
Sources: City GIS map

Map 3: Fremont Sub-Areas

0 1 2 3 4 5 Miles

N

Strategic Economics



Sources: Dun and Bradstreet; City GIS map

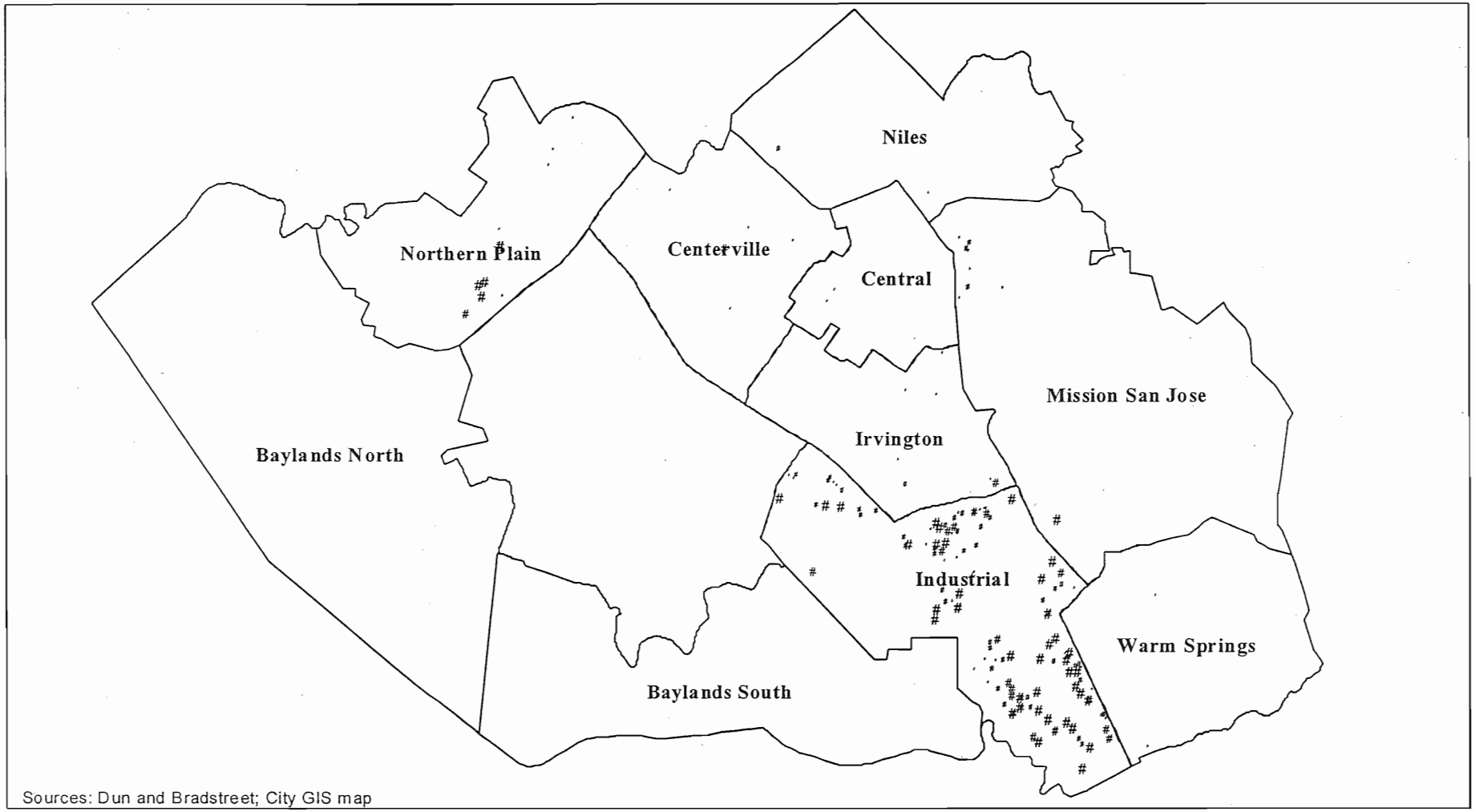
Number of Employees
- 0 - 10
- 11 - 50
- 51 - 100
- More than 100

Map 4: Fremont Businesses

Strategic Economics

0 1 2 3 4 5 Miles

N



Semiconductors
- 0 - 10 employees
- 11 - 50
- 51 - 100
- More than 100

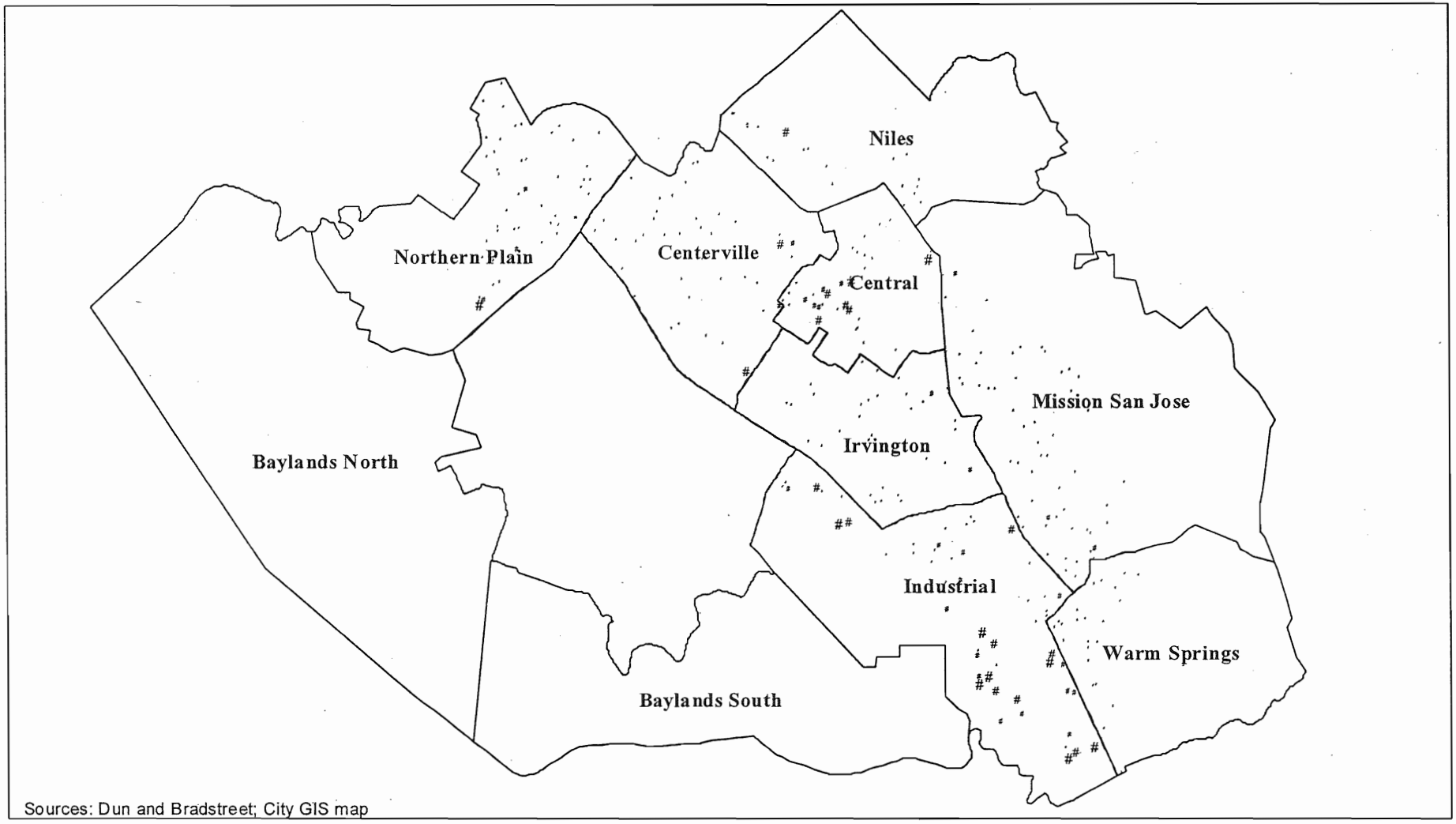
High-tech Manufacturing
- 0 - 10 employees
- 11 - 50
- 51 - 100
- More than 100

Map 5: New Economy Manufacturing

Strategic Economics

0 1 2 3 4 5 Miles

N



Sources: Dun and Bradstreet; City GIS map

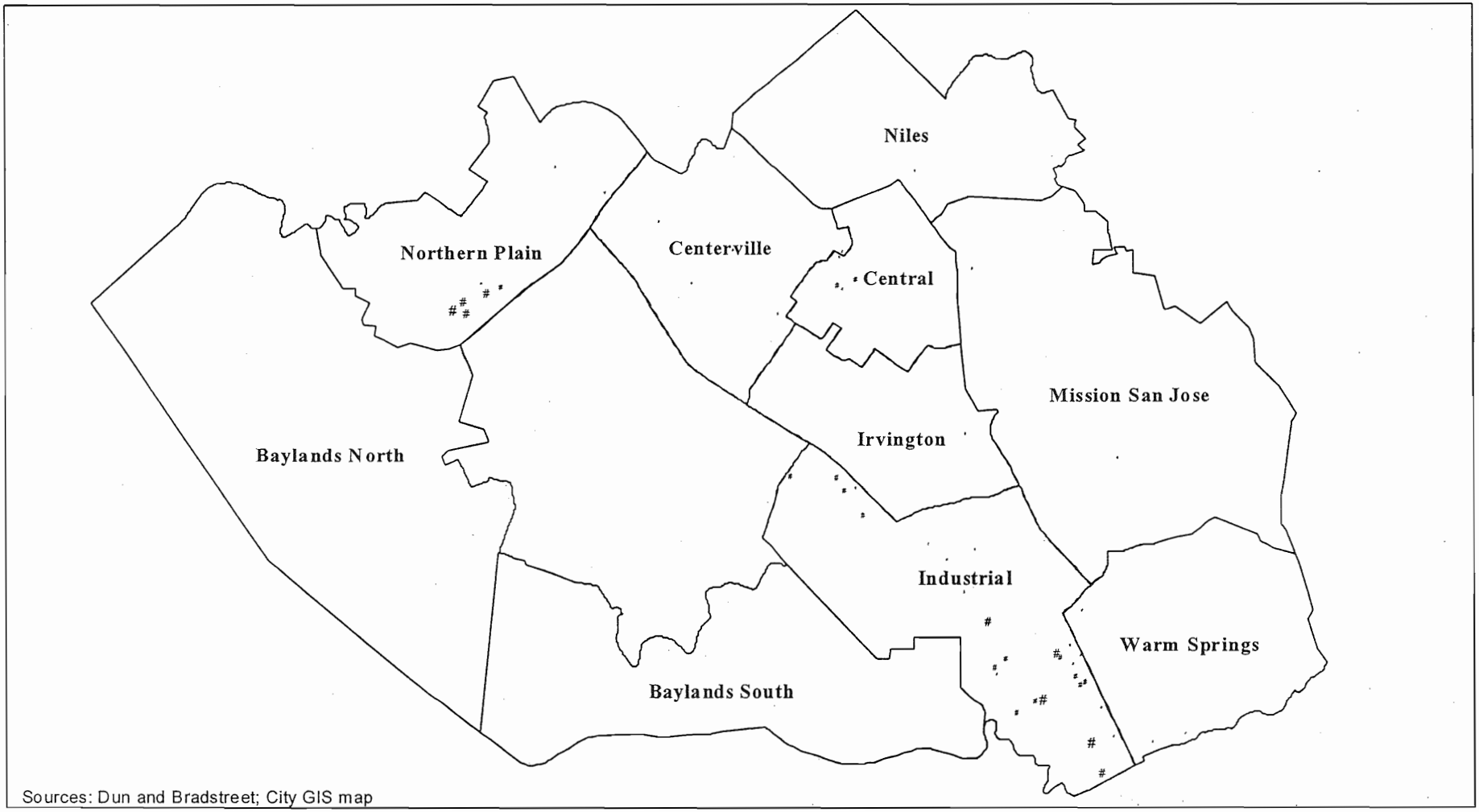
Number of Employees
- 0 - 10
- 11 - 50
- 51 - 100
- More than 100

Map 6: Software

Strategic Economics

0 1 2 3 4 5 Miles

N



Sources: Dun and Bradstreet; City GIS map

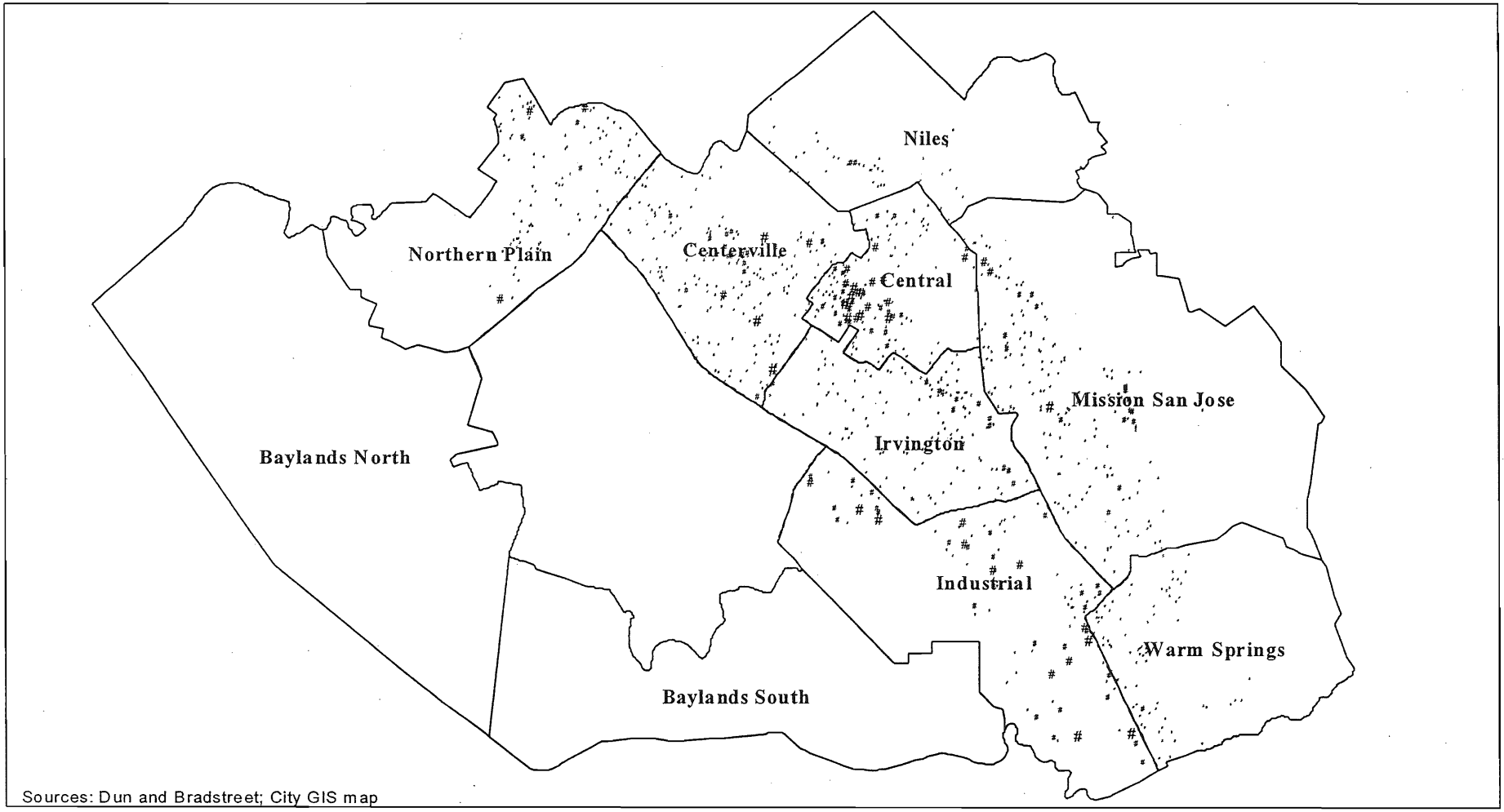
Number of Employees
- 0 - 10
- 11 - 50
- 51 - 100
- More than 100

Map 7: Biotechnology

0 1 2 3 4 5 Miles

N

Strategic Economics



Number of Employees
- 0 - 10
- 11 - 50
- 51 - 100
- More than 100

Strategic Economics

Map 8: Business Services

0 1 2 3 4 5 Miles

N

Table 14: Distribution of Industry Groups by Percentage of Employment

Subarea	TOTAL	Biotechnology	Business Services	Construction	Consumer Services	Health Services	New Economy Manufacturing	Manufacturing	Public Administration	Semiconductors	Software	Telecom	Wholesale Trade
Centerville	7.7%	0.4%	10.9%	7.6%	19.7%	7.9%	0.4%	4.8%	22.1%	0.0%	4.0%	3.0%	2.5%
Central	12.0%	2.7%	26.9%	2.5%	19.2%	77.2%	0.0%	1.2%	6.4%	0.0%	12.5%	11.8%	2.4%
Industrial	58.1%	67.8%	39.1%	59.7%	21.7%	1.1%	89.1%	86.6%	5.5%	72.6%	67.9%	74.3%	84.5%
Irvington	6.7%	0.0%	5.5%	15.9%	18.8%	6.7%	1.9%	2.7%	15.9%	0.0%	1.6%	3.0%	4.0%
Mission San Jose	4.7%	1.3%	8.3%	4.6%	6.7%	3.2%	0.5%	3.3%	20.1%	4.6%	3.0%	3.5%	2.0%
Niles	1.0%	0.0%	0.9%	2.0%	3.2%	0.0%	0.1%	0.1%	1.1%	0.0%	1.9%	0.0%	0.9%
Northern Plain	4.7%	22.8%	3.8%	1.3%	4.8%	0.5%	4.2%	0.8%	5.3%	22.8%	7.7%	1.2%	1.1%
Warm Springs	1.7%	0.2%	1.7%	1.6%	3.1%	1.1%	0.1%	0.4%	2.1%	0.0%	0.9%	2.8%	0.3%
Other	3.4%	4.9%	2.8%	4.7%	2.9%	2.2%	3.6%	0.1%	21.6%	0.0%	0.5%	0.5%	2.3%
TOTAL	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Note: Baylands South included in other because of insignificant employment.

Table 15: Distribution of Start-Up Firms by Percentage of Firms

Subarea	TOTAL	Biotechnology	Business Services	Construction	Consumer Services	Health Services	New Economy Manufacturing	Manufacturing	Public Administration	Semiconductors	Software	Telecom	Wholesale Trade
Centerville	14.0%	0.0%	13.0%	17.9%	22.7%	14.8%	2.6%	6.8%	40.9%	0.0%	10.4%	17.4%	9.6%
Central	13.6%	12.5%	16.4%	7.7%	10.5%	52.5%	1.3%	4.2%	4.5%	0.0%	14.8%	30.4%	5.5%
Industrial	27.2%	66.7%	21.5%	24.4%	15.8%	1.6%	81.6%	62.7%	9.1%	83.3%	26.1%	8.7%	55.5%
Irvington	11.2%	0.0%	9.1%	23.1%	20.0%	11.5%	2.6%	10.2%	9.1%	0.0%	7.4%	4.3%	7.3%
Mission San Jose	11.9%	4.2%	14.5%	6.4%	10.7%	6.6%	3.9%	4.2%	18.2%	8.3%	14.3%	13.0%	8.3%
Niles	3.6%	0.0%	3.6%	5.1%	5.0%	1.6%	0.0%	0.0%	4.5%	0.0%	4.6%	0.0%	2.8%
Northern Plain	9.4%	12.5%	11.2%	3.8%	7.4%	1.6%	6.6%	5.1%	4.5%	8.3%	12.9%	17.4%	4.6%
Warm Springs	5.7%	4.2%	7.2%	5.1%	4.4%	4.9%	1.3%	5.1%	4.5%	0.0%	6.0%	4.3%	3.2%
Other	3.5%	0.0%	3.5%	6.4%	3.6%	4.9%	0.0%	1.7%	4.5%	0.0%	3.5%	4.3%	3.2%
TOTAL	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Note: Baylands South included in Other because of insignificant employment.

Table 16: Average Size of Software Firms		
Subarea	Established	Start-up
Citywide	13.5	6.5
Industrial	35.1	14.6
Central	11.4	7.5
Northern Plain	8.1	4.7
Niles	5.5	1.9
Centerville	5.2	3.0
Irvington	3.0	2.2
Mission San Jose	2.8	2.3
Warm Springs	2.0	1.8
Source: California Employment Development Department, Strategic Economics.		

SUBAREA COMPETITIVENESS RATINGS

Table 17 shows the breakdown of jobs in each subarea by competitiveness rating. Roughly 50 percent of Fremont's total jobs are in strong industry groups and roughly one-third are in weak industry groups. However, the different subareas show markedly different concentrations of these jobs. Industrial and Northern Plain—two subareas that have captured many of the new economy jobs—both have roughly two-thirds of their total jobs in strong industry groups. At the other extreme, Irvington has less than one-quarter in strong industry groups and more than half in weak ones. Niles and Centerville also show low competitiveness, while Central and Mission San Jose occupy an intermediate ground.[16]

Table 17: Competitiveness Ratings by Subarea					
	Percentage of Jobs in Each Category				
Subarea	STRONG	EMERGING	STABLE	WEAK	OTHER
Industrial	67.1%	0.6%	0.1%	27.6%	4.6%
Northern Plain	66.3%	0.1%	0.7%	23.2%	9.8%
Central	37.6%	0.4%	30.6%	25.5%	5.9%
Mission San Jose	35.4%	0.3%	3.4%	34.2%	26.6%
Niles	33.6%	0.0%	0.2%	56.3%	9.9%
Centerville	26.0%	0.2%	4.9%	48.5%	20.4%
Irvington	23.7%	0.2%	4.8%	55.1%	16.2%
Warm Springs	19.2%	0.7%	3.0%	32.8%	44.2%
TOTAL	53.4%	0.5%	5.0%	31.2%	9.9%
Source: California Employment Development Department, Strategic Economics. Note: Other includes public administration. Baylands South not included because of insignificant employment.					

[16] In the case of Niles, the weakness is demonstrated as much by the high percentage of jobs in weak industry groups as by the low percentage in strong industry groups.

VI. WAGES AND JOB QUALITY

In order to measure the quality of jobs in different industry groups, Strategic Economics has developed a methodology that compares actual wages paid to a threshold level considered to be a "living wage."[17] Table 18 shows, for each industry group, the percentage of jobs that meet that threshold and that industry group's share of the city's total "quality" jobs.

Table 18: Quality Jobs by Industry Group

Industry Group	% of Jobs Meeting Threshold	% of Total Quality Jobs
Biotechnology	54.3%	3.1%
Business Services	27.0%	10.4%
Construction	64.0%	10.4%
Retail And Consumer Services	17.1%	8.0%
Health Services	41.4%	4.5%
New Economy Manufacturing	48.4%	23.7%
Semiconductors	51.0%	4.9%
Traditional Manufacturing	27.5%	6.0%
Public Administration	52.4%	10.3%
Software	89.7%	11.4%
Telecommunications	64.0%	0.8%
Wholesale Trade	44.8%	11.4%
Other	21.7%	2.8%
TOTAL	38.3%	100.0%

Source: California Employment Development Department, Strategic Economics.

Overall, slightly less than 40 percent of Fremont's jobs meet the quality threshold. Software has the highest overall job quality, with roughly 90 percent of its jobs meeting the threshold. Telecommunications and construction also have very high percentages of quality jobs. Biotech, new economy manufacturing, and public administration all have higher-than-average percentages of quality jobs. Health services and wholesale trade are roughly average, while business services, retail and consumer services, and traditional manufacturing provide low percentages of quality jobs.

Although there are clear differences in the proportion of quality jobs in each industry group, it is important to realize that some industry groups that fare poorly on this measure are still providing a significant number of quality jobs by virtue of their size. Business services and retail and consumer services together provide nearly 20% of total quality jobs despite low percentages of quality jobs.

However, most of Fremont's quality jobs are in industry groups characterized by relatively high proportions of quality jobs. New economy manufacturing alone provides nearly one-fourth of total quality jobs, and software, construction, public administration, and wholesale are all important contributors.

[17] See the Technical Appendix for details on this calculation.

An important question for the city is the extent to which high-quality jobs are concentrated in industry groups that are experiencing healthy economic growth or decline. Given the rapid growth of high-technology industry groups in Fremont, it should come as no surprise that there is a high degree of overlap between industry groups with high job quality and those that are growing quickly.

Table 19 summarizes job quality, competitiveness, and growth rate for all of Fremont's industry groups. The three fastest-growing industry groups—biotech, new economy manufacturing, and software—all have high percentages of quality jobs and competitiveness ratings of strong. Of the other three industry groups with high percentages of quality jobs, two (construction and public administration) have low growth while the third, telecommunications, experienced moderate growth. On the other hand, three of the six industry groups with competitiveness ratings of strong have average or low percentages of quality jobs. While this is not bad in and of itself, it does indicate that Fremont's job growth is not contributing to an improvement in job quality to the extent that it could.

Table 19: Performance Measures of Fremont's Industry Groups

	Job Quality	Competitiveness (in region)	Growth Rate
New Economy Manufacturing	High	Strong	High
Software	High	Strong	High
Biotechnology	High	Strong	High
Construction	High	Weak	Low
Public Administration	High	Stable	Low
Telecommunications	High	Emerging	Moderate
Health Services	Average	Stable	Low
Wholesale Trade	Average/High	Strong	Moderate
Business Services	Average/Low	Strong	Moderate
Retail and Consumer Services	Low	Weak	Low
Traditional Manufacturing	Average/Low	Weak	Moderate

There are two separate but related indications that overall job quality in Fremont is increasing. First, as Table 19 shows, the fastest-growing industry groups in Fremont all have high percentages of quality jobs and are increasing their share of total employment. Second, as shown in Table 20, the percentage of quality jobs in startup firms is higher than in all firms, indicating that the new jobs being created in Fremont are better, on average, than existing jobs.[18]

This fact has important implications for many aspects of the city's future. Most importantly, it is likely to drive an increase in housing prices as highly paid Fremont workers buy housing near their jobs. This may price less well paid workers—whether they are employed in Fremont or elsewhere—out of the housing market in Fremont.

GEOGRAPHIC DISTRIBUTION OF QUALITY JOBS

Table 20 shows the distribution of quality jobs by subarea. Industrial and Northern Plain have the highest percentages of quality jobs, which is not surprising given the prominence of high tech in their employment. Centerville, Irvington and Warm Springs have the lowest percentages. Most subareas

[18] The percentage of quality jobs shown in Table 20 differs slightly from the one in Table 18—41.6 percent compared to 39.4 percent—because the data are from two different sources. See the Technical Appendix for a complete explanation.

reflect the citywide pattern of increasing job quality—that is, a higher percentage of quality jobs in startup firms than in all firms—but Mission San Jose and Niles show signs of declining job quality.

Industrial subarea contains over 60 percent of Fremont's quality jobs, with the next-largest share in Central. Centerville, Irvington, Mission San Jose, and Northern Plain each contain roughly 5 percent of the city's quality jobs. The most significant trend seems to be Northern Plain's increasing share of the city's quality jobs.

Table 20: Geographic Distribution of Quality Jobs

Subarea	% of Jobs Meeting Quality Threshold		Subarea's share of Total Quality Jobs	
	All Firms	Startup Firms	All Firms	Startup Firms
Centerville	31.9%	35.3%	5.5%	5.3%
Central	39.2%	43.6%	11.1%	9.9%
Industrial	43.9%	49.8%	62.7%	61.8%
Irvington	33.4%	42.7%	5.4%	6.7%
Mission San Jose	42.0%	37.7%	4.7%	4.1%
Niles	37.5%	28.3%	0.9%	0.7%
Northern Plain	47.5%	53.2%	5.2%	7.5%
Warm Springs	30.3%	41.0%	1.2%	1.9%
Unknown	46.4%	41.8%	3.3%	2.2%
Baylands South	31.0%	0.0%	0.0%	0.0%
TOTAL	41.6%	46.6%	100.0%	100.0%

Source: Dun & Bradstreet, Strategic Economics.

VII. RETAIL TRADE AND TAXABLE SALES

Fremont is not meeting its internal demand for retail services. Table 21 shows total and per capital retail spending in Alameda County and a number of cities. In 1999 Fremont's per-capita retail spending was only 83 percent of the figure for Alameda County as a whole. Of comparable nearby cities in both Alameda County and Santa Clara County, Fremont had the lowest level of retail sales per capita. Moreover, Fremont stands in marked contrast to most other cities examined in that retail sales per capita declined between 1990 and 1999 despite steady population growth and a strong economy during the latter portion of the decade. This stagnation is also reflected in the slow growth in employment in the Retail and Consumer Services industry group, which expanded by only 15 percent from 1992 to 2000.

Table 21: Total and Per-Capita Retail Spending in Alameda County and Selected Cities

	1990		1999		Growth, 1990-1999	
Jurisdiction	$ (000s)	$/Capita	$ (000s)	$/Capita	Total	Per Capita
Dublin	553,841	$23,843	770,541	$25,140	39.1%	5.4%
Pleasanton	732,130	$14,478	1,133,083	$17,379	54.8%	20.0%
San Leandro	1,084,089	$15,890	1,074,201	$14,097	-0.9%	-11.3%
Milpitas	387,814	$7,651	762,084	$11,779	96.5%	54.0%
Livermore	362,781	$6,394	698,893	$9,432	92.6%	47.5%
Alameda County	10,426,442	$8,167	11,895,998	$8,225	14.1%	0.7%
San Jose	6,009,845	$7,683	7,304,879	$7,985	21.5%	3.9%
Fremont	1,245,062	$7,183	1,410,779	$6,843	13.3%	-4.7%

Source: Board of Equalization, Department of Finance, Bureau of Labor Statistics, Strategic Economics.
Note: 1990 figures expressed in 1999 dollars.

Fremont is slightly stronger in non-retail sales (i.e., wholesale and business-to-business), as shown in Table 22. Non-retail sales are proportionately more important than in many of the other cities, accounting for roughly 40 percent of Fremont's total taxable sales, but in terms of per-capita sales Fremont lags well behind cities such as Milpitas, Pleasanton, and San Leandro.

Table 22: Total Taxable Sales (Retail and Non-Retail), 1999

Jurisdiction	Retail	Other	Total	Retail as % of total	Non-retail/capita	Total $/capita
Dublin	$770,541	$138,596	$909,137	84.8%	$4,522	$29,662
Pleasanton	$1,133,083	$514,164	$1,647,247	68.8%	$7,886	$25,265
San Leandro	$1,074,201	$596,768	$1,670,969	64.3%	$7,832	$21,929
Milpitas	$762,084	$571,419	$1,333,503	57.1%	$8,832	$20,611
Livermore	$698,893	$459,643	$1,158,536	60.3%	$6,203	$15,635
Alameda County	$11,895,998	$8,776,289	$20,672,287	57.5%	$6,068	$14,292
San Jose	$7,304,879	$4,012,234	$11,317,113	64.5%	$4,386	$12,371
Fremont	$1,410,779	$996,158	$2,406,937	58.6%	$4,832	$11,676

Source: State Board of Equalization.

Table 23 shows a breakdown of per-capita taxable sales by category. Fremont's per-capita sales are higher than Alameda County's in only two categories, food stores and automotive. It is likely that in all other categories Fremont is leaking significant retail dollars to other communities. Apparel, general merchandise, and home furnishings and appliances are especially weak categories.

Table 23: Per Capita Sales by Retail Category, 1999

Retail Category	Alameda County	Fremont	Fremont as % of Alameda County	San Jose	Milpitas
Apparel	$279	$61	21.9%	$303	$1,532
General Merchandise	$1,241	$703	56.7%	$1,280	$1,639
Food Stores	$455	$504	110.9%	$415	$533
Eating and Drinking Places	$904	$737	81.5%	$872	$2,110
Home Furnishings and Appliances	$409	$244	59.6%	$403	$1,028
Building Materials and Farm Equipment	$843	$775	91.9%	$680	$956
Automotive Group	$2,397	$2,519	105.1%	$2,294	$1,280
Total Retail	$8,225	$6,843	83.2%	$7,985	$11,779
Non-Retail	$6,068	$4,832	79.6%	$4,386	$8,832
Totals all outlets	$14,292	$11,676	81.7%	$12,371	$20,611

Source: State Board of Equalization, Department of Finance.
Note: Automotive group includes auto sales, auto supplies, and service stations.

Given Milpitas' proximity to Fremont and its high level of per-capita sales, particularly in the categories in which Fremont is weakest, it is reasonable to assume that Milpitas is capturing significant spending from Fremont. Milpitas has been more successful at providing large-scale region-serving retail, including specialty retail such as stores catering to the region's large Asian population. Newark has captured a significant amount of retail, including several large stores that have left the Fremont Hub.

The result is that Fremont lags behind Alameda County and nearby cities in total taxable sales. This clearly has significant implications for the city's revenue base and should be taken into consideration when formulating policy.

Fremont's weakness in retail sales appears to have more to do with the performance of the city's retail establishments than with the amount of retail space. That is, the city has enough retail, but it is underperforming. The weak performance appears to be due to three main factors.

First, anecdotal evidence suggests that many shoppers looking for higher-end goods travel to Walnut Creek, Palo Alto, and San Francisco because they are not satisfied with the selection in Fremont. Although the Fremont Hub has made some efforts to upgrade its retail mix, it is unclear how successful this effort has been. Fremont is therefore losing out on opportunities to serve the affluent population within its own borders.

Second, Fremont's main retail center—the Fremont Hub—was conceived as freeway-oriented retail to serve the proposed Foothill Freeway (S.R. 238), which was never built. As a result, Fremont's CBD is home to freeway-oriented retail far from the freeway. Such retail neither performs as well as it might in a different location nor contributes to a vibrant pedestrian-oriented downtown environment.

Third, the city has not paid enough attention to ethnic market niches. Fremont's large Indian, Chinese, and other Asian communities often have specific market preferences that are left unmet in Fremont.

Although McCarthy Ranch in Milpitas is meeting some of the demand for ethnic-specific retail, there are few high-end establishments catering to specific ethnic groups in the area. Experiences in other parts of the Bay Area—such as San Mateo County—show that there is a market for upscale restaurants that cater mainly to particular ethnic groups. Fremont's demographic diversity is a strength that can help position to city to provide specialty retail to serve populations beyond the city's borders.

The solution, therefore, is not simply to build more retail space, but rather to develop a strategy to provide unique retail offerings and fill a niche. Such a strategy does not rule out the possibility of strategic expansion of big box retail, such as the current projects involving Target, Costco, and Home Depot. However, it highlights the importance of physical planning as a key element of the city's economic development strategy. Fremont should create physical places for high-end and specialty retail to come into the city, including an attractive downtown. Equally importantly, the preferences of all Fremont's ethnic groups should be explicitly taken into account when thinking about the most desirable retail mix. This will help maximize the city's capture of retail spending by Fremont residents and residents of other cities alike.

VIII. REAL ESTATE

Fremont lies along the edges of two important subregional markets: the southern end of the East Bay market and the northern edge of Silicon Valley. Commercial and residential real estate activity in Fremont, like the greater Bay Area, reached unprecedented levels in the late 1990s. In this "hot" market, Fremont's unique identity and assets became more apparent.

As Silicon Valley diffuses outward, Fremont is in rapid transition. Rents for most types of industrial and R&D space nearly doubled from 1999 to 2000, and millions more square feet of new product were planned. As many high-tech companies moved into Fremont and expanded there, some traditional industrial users have been priced out of Fremont, with some relocating northward to areas like Oakland and San Leandro, and others moving much further out to the Central Valley. At the same time higher priced office, R&D, warehouse, and manufacturing space is being built on a large scale at Pacific Commons, as well as other smaller sites in the city.

Fremont's real estate market was strong in the last economic cycle, and promises to be strong again when the economy recovers. The Association of Bay Area Governments projects that Fremont's employment will grow to 114,640 by 2010, an increase of more than 20 percent over the 2000 level. This will translate into significant demand for new real estate, both commercial and residential.

As a result, it is likely that in the next economic cycle there will be significant incentives to redevelop underutilized land and industrial properties. Pacific Commons represents a paradigm of development that is well suited to Fremont's future because it integrates several different types of space (including retail) and is built at a higher density than most existing development. By encouraging such high-density development, especially in conjunction with improved transit access, the city can make more efficient use of its land resources and create incentives for upgrading older industrial properties.

Residential development should also be considered part of the city's economic development strategy. By creating a mix of housing types that appeal to a broad spectrum of residents, Fremont can attract the resident labor force that can in turn help the city attract and retain firms.

This chapter starts with an overview of different product types in Fremont. It then examines each of those product types within the context of individual subareas.[19]

PRODUCT TYPES

R&D/FLEX

Despite the slowdown of the national economy, R&D space in Fremont and Silicon Valley remains relatively stable. With 20,400,000 square feet, Fremont contains one of the largest R&D building bases in Silicon Valley. Although vacancy in Fremont has increased from 4.8 percent to 6.9 percent since Q1

[19] Many of the prices cited in this chapter were gathered in late 2000 and early 2001. With the exception of the section entitled "Product Types" these prices have not been updated. However, despite declines in real estate prices during the last six months, the relative values expressed in those sections remain largely accurate. That is, they convey an impression of how different real estate products compare to one another both within Fremont and between Fremont and other areas.

2001, the average asking rent of $2.60 NNN[20] still exceeds levels reached during Q2 2000 by 35 percent. Q1 2001 also saw negative absorption of 18,000 square feet; however, on a gross basis, Fremont has absorbed more R&D space than any other Silicon Valley submarket (991,000 square feet in Q1 alone). Fremont remains one of the more affordable R&D areas compared to the innermost Silicon Valley cities, where rents have reached the $4 and $5 range.

Most firms are seeking R&D spaces with two-thirds or more of the area devoted to office. In fact, some office users priced out of Silicon Valley during the boom began occupying R&D space in Fremont. Most tenants are seeking wide open flexible floorplans, significant expansion capacity, 100 percent HVAC, fiber connectivity, and parking ratios of 3.5/1000 or higher. Higher end tenant improvement packages ran in the $20 range for new product. Freeway proximity is still a high priority, and many firms are seeking an identity incorporating exterior glass and landscaping.

OFFICE

Although Fremont office rates have declined from their fall 2000 levels, at $3.71 NNN they still surpass the Q2 2000 average asking rate by 35 percent. This rate exceeds the increase in other areas of Silicon Valley during the same time period. Nevertheless, Fremont office space remains one of the most affordable options in the Silicon Valley market. Vacancy rates have gone up slightly since the Q1 2000, from 7.4 percent to 8.8 percent. The 880 Corridor South (Milpitas and Fremont) is the only area of Silicon Valley that has experienced positive net absorption during Q1 2001. In addition, it is the only area where the vacancy rate declined from the 2000 average. Vacancy factors are purportedly attributable to the introduction of sublease space by companies whose plans for expansion were stalled by unfavorable market conditions.

There is a shortage of small office space in Fremont. Faced with competition from high-tech users during the last market upswing, some traditional local professional and service office began to consider co-locating with retail uses for the first time. There is also a need for small office spaces with shorter leases to serve the needs of rapidly growing start-up firms.

WAREHOUSE

The warehouse sector remains steady in the current market. The overall warehouse vacancy in Silicon Valley was a healthy 5 percent at the end of the first quarter 2001, while Fremont showed a vacancy rate of 4 percent. Fremont's warehouse building base of 8.5 million square feet showed an average rent increase of 35 percent from Q2 2000 to Q1 2001 ($.61 to $.94 NNN). During this period, Fremont was the only Silicon Valley city to add new warehouse product to the market, with 70,552 new square feet. With a first quarter gross absorption of 284,000 square feet, Fremont was the most active among the sub-markets. Net absorption was relatively high despite new construction, at negative 40,000 square feet.

MANUFACTURING

Silicon Valley manufacturing market vacancy rates remained low at 4.4 percent at the closing of the first quarter. Rents in Fremont, whose building base is over 9.5 million square feet, have increased by 31 percent since Q2 2000 for a current average asking rent of $1.37. This rate is one of the lowest among Silicon Valley sub-markets, whose rents typically fall in the $2.00 to $3.00 range. Despite new construction totaling more than 400,000 square feet, Fremont is absorbing the space relatively quickly, with a current vacancy rate of 7.4 percent.

[20] NNN=triple net, N=net, FS=full service. All rates given in monthly terms.

Many older industrial properties performed so well during the economic expansion that owners were disinclined to convert or upgrade to higher end uses. New industrial space was nearly as expensive as a lot of R&D product.

RESIDENTIAL

The quality of Fremont's housing stock has important implications for the city's economic development because it determines the types of residents the city can attract. Since residents can be either employees or entrepreneurs, the resident mix has an impact on the types of firms that will locate in Fremont. The housing stock also has important implications for quality of life. A greater variety of housing types can accommodate a wider variety of people at different stages of their life cycles.

In conjunction with population growth, the production of housing units in the city moved relatively quickly over the last two decades, at a rate of 3.3 percent per year from 1980 to 1990, and an estimated 1.6 percent from 1990 to 2000. By contrast, average annual rates for the other areas in question during the same time period did not exceed 1.3 percent. Similar to population growth rates, housing unit production in Fremont is projected to level off to a more modest annual rate of 1.1 percent from 2000 to 2005.

First American Real Estate (FARES) data showing single and multifamily home sales for the past year were used to calculate median home prices by area. Over 2,000 listing yielded a citywide median $375,000 between September 1999 and September 2000). By far the highest median home price was $598,000 in the Mission San Jose area, followed by Warm Springs with $420,000. The lowest prices were in the Central ($288,000) and Irvington ($330,000) areas. A total of 54 homes sold for over $1 million.

FARES data were compared to data from RAND, which calculates medians based on sales data from the California Association of Realtors. The RAND data show the city median home price increasing from $369,000 to $425,000 over the six-month period from March to August 2000. It is reasonable to assume, based on both data sources and the rapid rate at which prices are increasing, that Fremont's current median home price lies somewhere between $400,000 and $425,000.

RETAIL

Although Fremont's retail sales are not especially strong, the retail real estate market was showing signs of improvement in the late 1990s. Vacancies were in the single digits in most areas and rents had increased approximately 10 percent over last year. More destination retail is slowly moving into area, and several big-box stores are set to open.

SUBAREAS

According to broker interviews conducted in July, 2001, different Fremont submarkets have responded to the recent market changes in various ways. Industrial areas where larger buildings offer sizeable blocks of R&D space have been hardest hit. In the Industrial area surrounding 880, and the Warm Springs area, R&D rents have purportedly dropped by 30 percent or more since last fall's market high. At Ardenwood, where rents spiked highest during the third quarter 2000, a similarly dramatic rent decline has occurred, as much as 50 percent. R&D vacancy rates, which were recently within the 3 percent range throughout the city, have moved up to the 7 percent range.

NORTHERN PLAIN

R&D/Office

Ardenwood Corporate Commons, Fremont's highest end R&D development to date, has been expanding under multiple developers since construction began in the 1980s. The park consists of one and two story buildings in an expansive landscaped campus setting. Buildings generally range in size from 40,000 to 150,000 square feet and are mostly single user occupied with on-site cafeteria/ food services and other amenities (i.e. gymnasium) which blend some attributes of class A office space with the functionality and technological features of R&D. There is a majority of biotechnology companies whose activities focus in office space with a combination of lab space and manufacturing. Several companies are among the top forty employers in Fremont. Because the companies located in this project draw their workforce primarily from the Peninsula and South Bay, areas with no public transit linkages to Fremont, parking ratios are high, mostly 4/1,000 square feet.

Apart from the high-tech building features, higher-end rents of $3.00 to $5.00 in the park are explained by the following factors: high identity (extensive glass, landscaping and campus atmosphere), easy and close access to the Peninsula (via reverse commute), South Bay and East Bay housing markets, and plentiful parking.

Although the exact amount of remaining developable space at Ardenwood was not available, there are at least 1.5 million square building feet planned. Higher densities, with some buildings up to three stories, will be a more likely design scenario in the current market. Two developers are currently developing space in the park.

Retail

Retail in the Northern Plain area consists of several local-serving centers with small retail, entertainment and service tenants. These include Ardenwood Center, Ardenwood Plaza and Charter Square. Rents in these centers range from $1.50 to $1.75 NNN. The leasing agent for one of the larger centers stated that the smallest spaces tend to perform best, that rents have increased approximately 10 percent over the past year, and that vacancies have remained low. The ownership at the entertainment-oriented Ardenwood Center is currently attempting to attract those smaller office users who have been priced out of other space in Fremont; 10,000 square feet of space is being marketed towards office local office users in an attempt to capitalize on spillover from the tight office market. A local broker expert states that office-type users may begin to trend increasingly towards occupying space within retail centers. This indicates an acute shortage of small office space in Fremont, a gap that development in the CBD may be able to fill.

Residential

Home sale prices over the time period of September 1999 to 2000 show that house values in the area are on a par with the city as a whole. In Northern Plain, median home prices were $271,500, $359,500, and $430,000 for a 2-bedroom, 3-bedroom and 4-bedroom, respectively. Overall these medians are slightly below the city, as is shown by a $371,500 median for all bedroom types in Northern Plain, as compared to $375,000 citywide.

CENTERVILLE

Retail

Retail in this area consists of strip centers tenanted by neighborhood-serving retail and office tenants, primarily concentrated along Fremont Avenue, Thornton Boulevard and Decoto Road. Rents currently range from $1 to $1.50 NNN, and are said to have gone up slightly in the last year. Most centers have no space available and overall vacancy is below 5 percent. Triple net costs for older space are often significantly lower than in newer space. It is anticipated that a more national, competitive retail climate and higher rents in the CBD could move smaller retail tenants outward into this area.

Residential

FARES data show that Centerville is more affordable than the city as a whole. Nearly a third of the listings pulled for this area were condominiums, which in part accounts for the slightly lower prices. Median home prices were $230,000, $387,000, and $438,000 for a 2-bedroom, 3-bedroom and 4-bedroom, respectively. Overall these medians are slightly below the city, demonstrated by the $355,000 median for all bedroom types in Centerville, as compared to $375,000 citywide.

Office

Office is limited to dispersed local professional, service and medical tenants located primarily within retail centers.

CENTRAL

Retail

The Central area has a higher concentration of national retailers than other areas of the city, and is upgrading its image as a destination retail node with the addition of new residences, offices, and improved linkages around the BART area. Most of these centers are clustered along Mowry Avenue and between Mowry and Walnut Avenues. Fremont Hub is the largest in the area and commands the highest rents. Overall, the centers located along Mowry Avenue command higher rents than those on north-south streets, due to their ability to capture through freeway traffic. Purportedly, rents have edged upwards in the last year and are running from $1.50 to $2.50 NNN, while vacancies remain in the single digits.
A planned mixed-use project, Village at Civic Center, will include 85,000 square feet of commercial space on Stevenson Boulevard and Civic Center Drive. The addition of new class A office space and residential units in the Central area over the next couple years will create new consumer markets for downtown retailers. In addition, plans to unify the area and create a more shopper-friendly spatial configuration could draw more destination shoppers if a competitive tenant mix is achieved.

Office

To date, office space in the Central area has primarily shown a suburban-type occupancy pattern, with medical and local professional tenants occupying relatively small space increments in different buildings. Class B space commands $1.50 gross to $1.85 gross. Class B+/A- space is commanding $1.75 to $2.15 NNN. One larger scale office project, Fremont Office Center, has seen rents increase from $2.40 FS in the Q1 2000 to $3.25 by early Q4. Built in the mid and late 1980s and totaling 180,000 square feet in two buildings, the project has remained at nearly 100 percent occupied since the beginning of the year.

Tenants are a mix of traditional professional financial and medical services, as well as newer internet and other technology-based firms.

The unprecedented demand for office space in the region has led to the development of new class A projects in the Central area. Village at Civic Center and Civic Center Place will be charging $2.50 and $3.50 NNN, respectively. The 5-story Civic Center Place has had nearly all its 110,000 square feet pre-leased, primarily by technology start-up firms.

Regional office market conditions have enhanced Fremont's potential for luring larger office users. In addition, BART's presence has become increasingly attractive to prospective tenants subject to worsening Bay Area traffic conditions. The implementation of the Concept Plan for the downtown, which calls for a mix of retail and commercial uses and improved linkages for the CBD will serve to coalesce the area's competitive advantages by giving it a more marketable urban feeling.

Brokers interviewed generally agree that office space downtown will not likely compete with the R&D space that is located in areas of Fremont with closer freeway proximity. Companies at these locations draw their employees primarily from the South Bay and Peninsula, and prioritize freeway access for their car-dependent workforce. However, with increasing congestion and a growing disaffection with long car commutes, the BART station will very likely attract employers whose workers live in other transit-accessible areas in the East Bay, San Francisco and Contra Costa County. In addition, the development of residential and retail uses will create greater amenity for local offices.

As of July, 2001, Fremont's small class A downtown office market has withstood the market fluctuations relatively well, although demand has dropped off significantly. Rents have dropped only slightly, and currently range from $2.75 to $3.00 FS. A newly constructed Class A office building, Civic Center Place, is now fully leased by high-tech and related companies. Relatively stable occupancy in the downtown market is attributable to 1) a loyal professional tenant base and 2) a newer high-tech tenant base that is attracted by relatively affordable rents within close proximity of a skilled work force, and proximity to BART. Vacancy rates for class A office space downtown are estimated at 4 percent. Despite the relative stability of the downtown office market, construction plans are postponed for Civic Center Place II due to soft demand.

Residential

The Central area is one of the more affordable locations in the city. Median sale prices for the past year show a 2-bedroom sale price of $240,000, a three-bedroom median price of $300,000 and a 4+ bedroom median price of $475,000. The median for all homes is $288,000, as compared to $375,000 for the entire city. Lower overall home prices are likely attributable to the prevalence of the multifamily housing type in this area: condominiums accounted for over 70 percent of the records listed for the year period.

IRVINGTON

Retail

Retail space in Irvington is located in neighborhood shopping centers as well as some storefronts in the old downtown Irvington area. Purportedly rents average $1.35 NNN, with the high end space at $1.75 in the grocery-anchored center. Irvington retail draws from through traffic of Mission San Jose area residents. Overall, vacancy is low, with most centers reporting no space available. Purportedly, the potential for retail expansion is high in the area due to high traffic volumes and access to high income households. In addition, the area could capture spillover from the CBD if rents rise as expected.

Office

Office space is generally limited to local service tenants within retail centers.

Residential

Home prices in Irvington are more affordable than the city average. The average median home price in Irvington for the time period reviewed was $330,000 as compared to the median of $375,000 for the city. Median home prices in Irvington for a two-, three- and four+ bedroom were $263,500, $327,500 and $375,000, respectively.

Industrial

The industrial portion of the Irvington area consists of relatively small-scale warehouse and light industrial space interspersed with residential space along Osgood Road. Currently there is a range of activity, from self-storage to light manufacturing. Older small manufacturing incubator units purportedly average about $1.25 per square foot. A recently completed 12-building light industrial project sold individual buildings ranging from 10,000 to 20,000 square feet at $114 to $124 per square foot. These buildings were each built out with 1,000 square feet of office and were bought primarily by electronics companies.

INDUSTRIAL AREA

R&D and Industrial

The Industrial subarea has more overall industrial land use area than any other part of Fremont, accounting for at least two thirds of the total use pattern. Under the technology-driven market conditions of the 1990's, R&D space has emerged as the predominant product type in these areas, and is currently distributed into different geographical "nodes" where often it is interspersed with more traditional light industrial and warehouse space. Running north to south these different nodes are: Stevenson Boulevard, Automall Parkway, Bayside area west of I-880, and Warm Springs Boulevard. It should be noted that Warm Springs Boulevard is commonly considered to lie within the Warm Springs area, but that the Fremont planning area boundaries assign the west side of Warm Springs Boulevard to the Industrial area. For the purposes of this analysis, the industrial component of the Warm Spring Area will be treated as a part of the Industrial area. In addition, vacancy as a market indicator is ignored in favor of rental rates, due to the near non-existence of vacant R&D and industrial units. Following is a description of the different R&D/Industrial nodes by subarea within the Industrial planning area.

Stevenson Boulevard west of I-880 is home to newer multi-tenant R&D parks, as well as traditional light industrial manufacturing and distribution centers located in both single user and multi-tenant buildings. New R&D projects include Stevenson Center, Stevenson Business Park, and in Newark the Stevenson Point Technology Park which is currently under construction and will include 6 buildings. Rents in these parks range from $2.25 N to $2.50 NNN and parking ratios are generally 3.5/1000. The high-technology tenants occupying the bulk of space here draw their employees primarily from the South Bay, as well as the Peninsula. When shopping for space these high-tech firms are prioritizing high-technology office features such as dropped ceilings and 100 percent HVAC. Although many companies still maintain a portion of space in manufacturing activities, increasingly firms are building out 80 percent to 100 percent office

Older multi-tenant warehouse space in this area lies along Albrae Street fronting the I-880 and consists of small buildings occupied by home improvement and automotive retailers that combine retail storefront and warehouse. Rents are in the $0.50 NNN range.

Major warehouse distribution and manufacturing space is also located in this area. Westward from the freeway along Boyce Road. Catellus' Pacific Industrial Center, houses two of Fremont's major computer electronics manufacturing companies, Galgon Industries and Victron Inc. The area between Stevenson and Automall Boulevard is home to other warehouse and manufacturing activities such as Sysco's distribution Center on Stewart Avenue.

Automall Parkway. Pacific Commons, an eight-million plus square foot mixed-use project, plans for nearly seven million square feet of office and R&D space. To date, several light industrial and warehouse buildings have been built and leased while others are under construction. Pacific Commons will introduce novel design elements into the Fremont market such as 12-story building heights, structured parking and on-site services and amenities that make the park self-contained for its workforce. In addition, shuttles and links to major forms of transit will widen the scope of the park's employment base and should attract a wide range of companies. Other than Pacific Commons, R&D space currently under development along Christy Street is currently asking $2.50 NNN.

Recently built light manufacturing and warehouse/distribution space is located along the Automall Parkway. Headquartered in Milpitas, Creative Labs maintains its distribution center on Automall Parkway. A multi-tenant manufacturing project, Automall Business Center, currently being built at Grimmer Boulevard and Automall Parkway has edged its asking rents up from $1.75 to $2.25 NNN with a $10 per square foot tenant improvement allowance. The project comprises five to seven buildings ranging in size from 19,000 to 45,000 square feet. In addition, the gap between manufacturing and R&D rents appears to be shrinking, with certain manufacturers willing to pay a premium for staying in the vicinity of Silicon Valley. While manufacturing and distribution space provides parking at a ratio of two to three per 1,000 square feet ratio, the higher employment densities in today's R&D space necessitate a minimum of 3.5 per 1,000 square feet.

Bayside. The Bayside area is home to most of Fremont's major employers. Bayside Business Park comprises 2 million square feet within 56 buildings housing 178 companies within a campus setting. All but one building are single story. Originally designed as an office/warehouse flex project with typical buildouts at 30 to 50 percent office, typical tenants in the current market need 60 to 100 percent office space. The shift from a warehouse/distribution park to mostly office/R&D has put a strain on the parking capacity at Bayside. The 3.5 to 1000 ratio has proved inadequate in cases where there is high office buildout. The management has responded by 'striping' areas such as truck wells that were formerly used for warehousing functions. Five-year lease renewals in September 2000 were showing rent increases of approximately 30 to 40 percent. A 30,000 square foot building that in late 1999 was commanding rents of $1.10 to $1.20 NNN, leased in September for $1.85.

Warm Springs. The area between Warm Springs Boulevard and I-880 is characterized by R&D and light industrial uses, as well as a significant amount of undeveloped land along I-880. Currently at least one quarter of Fremont's top employers are located in this area. Buildings range in age from the early 1980s to the present, and are typically one and two-stories with 3.5 to 4 to 1000 square feet of parking. Rents have increased 50 to 80 percent over the last year. Reportedly, tenants are increasingly Internet, broadband and DSL companies with high office space requirements. These and other high-technology tenants are seeking space with high power and 100 percent HVAC so that as manufacturing space is absorbed into office, infrastructure can accommodate a higher number of cubes. As rents have risen and available space has diminished many manufacturing tenants have moved to areas where rents are cheaper such as Livermore, Hayward and San Leandro. Rents in Warm Springs currently range from $1.75 to

$3.25 NNN. Because many firms are undergoing or anticipate expansion, many occupy space larger spaces that they can grow into and build out as necessary.

The 95-acre Kato Business Park, located along I-880 between Dixon Landing Road and Mission Boulevard will erect up to 1.5 million square feet of R&D and industrial product. The property is now available on a build-to-suit basis to R&D and manufacturing/ distribution users of 100,000 square feet and up.

Retail

Stevenson Boulevard. Anchored by Home Depot, the Desert Center at Stevenson Boulevard and I-880, is a home improvement and furniture destination center where rents currently range between $.75 to $1.25 NNN. An additional 7,000 square feet have been approved and an offer of $1.00 per square foot from a furniture retailer seeking 10,000 to 14,000 square feet is currently being negotiated. This area is also home to several restaurants whose clientele base is generated by growing industrial, retail and R&D area employment. Restaurant pads are renting for as high as $2.00 per square foot, and have increased due to the recent construction activity and employment growth.

Automall Parkway. As the first example of regional destination retail in the Industrial area, REI and Home Depot are co-locating at Fremont Boulevard and Automall Parkway, targeting November 2000 as the opening date. REI chose the site based on access to a wide area (in this case via the I-680 and I-880) and a 15-mile trade area with a high percent of college-educated small families with an annual income of $100,000 or more. REI purchased the site, and would not have located there under a lease arrangement. The store will employ approximately 100 people. Some additional pad spaces will also be built.

Residential

The relatively small amount of residential development in the Industrial/Baylands area is located just west of the Mission San Jose and Warm Springs areas, west of I680. Home prices are quite high relative to the city on average. Two-, three-, and four+ bedroom average prices are $288,000, $437,500, $523,000. The area median is $415,000 as compared to the city median of $375,000.

MISSION SAN JOSE

Retail and Office

Retail and office in Mission San Jose serves the surrounding high income neighborhoods. Retail space in strip centers ranges from $1.20 in lower end space to $2.00 NNN in a grocery-anchored center. Office uses are located among retail, and include realty services as well as other local professionals serving the immediate neighborhood. Some free-standing retail is located near the Mission, and captures local as well as visitor activity.

Residential

Homes in the Mission area are the highest priced in the city, with an overall median of $598,000. Prices for a two-, three- and four+ bedroom home are $410,000, $520,000 and $731,000. Single family houses comprise most of the product in the area

WARM SPRINGS

Residential

Home prices in Warm Springs are higher than most parts of Fremont, with an area median of $420,000 as compared to the city's $375,000.

Retail

Retail in the Warm Springs area is limited to several neighborhood centers. Warm Springs Plaza is a grocery-anchored center at Warm Springs Boulevard and Mission Boulevard where rents run up to $2.75 NNN. The high rent levels may be attributable to the proximity of major R&D and industrial employment, as well as high traffic volumes. This center has a high percentage of restaurants serving the daytime lunch crowd.

NILES

Retail and Office

Niles commercial development has been shaped by the former town's historic character as well as its relative isolation from other parts of Fremont. The area consists exclusively of small independent stores and restaurants, with a high concentration of long-standing antique stores. The area is a weekend destination, as well as host to different themed annual activities which bring people to the area. Office space is located at ground floor and above retail in many of the historic buildings, as well as in some free-standing structures. Rents in Niles on a whole are cheaper than any other area of the city. It is likely though, in the current market, that the area will see an increase in activity and rents with small users being pushed out of other markets.

Residential

Niles home prices lie towards the high end of the Fremont residential market. Due to its small area, a relatively limited number of listings were available for the last year. The median home price from these listings was $401,000.

IX. FINDINGS AND RECOMMENDATIONS

FINDINGS

Finding 1: Fremont has notable assets that enabled it to prosper during the 1990s.

The data presented earlier paint a clear picture of Fremont as an economic success in the 1990s, enjoying strong employment growth, particularly in industry groups with high-quality jobs, and a healthy real estate market that spurred investment without becoming overheated.

This success is the result of Fremont's assets, which have made it a desirable location for some segments of the region's growing employment base. The principal assets are:

- **Community Quality.** Fremont is generally viewed as a good place to live, a good place to raise a family, and a good place to start a business. It is increasingly apparent that quality of life is directly related to the economic success of cities and regions that base their development on high-skill, high-wage industries. Fremont can continue to improve its quality of life as an integral part of an economic development strategy.
- **Demographics.** Fremont's residents are one of its key economic development assets as should be viewed as such. The city's population not only constitutes a talented labor pool that can attract firms to Fremont, but also a pool of entrepreneurs. The skills and energy of these entrepreneurs could be harnessed more directly to contribute to the strength of certain key industries in the city.
- **Diversity.** Economic and demographic diversity are among Fremont's key selling points as a residential community and employment center alike. Demographic diversity is important for attracting talented residents who can play an important role in its economic development. Economic diversity can help cushion the city against large boom/bust cycles. Real estate diversity is important for attracting a wide range of residents and businesses.
- **Education.** Fremont's schools are significant attraction for highly educated residents. Because of the role that a talented population can play in economic development, high-quality education should be viewed not just as a means of educating a local workforce, but also as a way to attract highly skilled and entrepreneurial residents.
- **Geography.** Fremont's location within the region and in relation to principal job concentrations is an important, if largely fortuitous, factor in its economic success. Fremont's combination of proximity to Silicon Valley and relatively affordable real estate makes it attractive to certain types of firms. However, other firms—mainly software firms—tend to bypass Fremont in favor of the Tri-Valley area if they choose not to locate in Silicon Valley. The city should leverage its geography when favorable and, in certain cases, find ways of compensating when it is not.
- **Real Estate and Land Supply.** Fremont has been able to respond to demand by providing appropriate real estate types at the right time. Maintaining the ability to do so will be central to the city's continued success, but this will require efficient and effective use of the city's limited land supply.
- **Transit.** Fremont's transit infrastructure will likely prove increasingly attractive to certain residents and firms as traffic congestion in the region grows. The city can capitalize much more effectively on these assets, as will be discussed below.

Finding 2: Fremont's economy is becoming more and more linked to new economy industries.

Roughly one quarter of the city's job base is now in new economy industry groups (biotechnology, new economy manufacturing, software, telecommunications) and these groups account for 44 percent of the jobs created between 1992 and 2000. In addition, some of the traditional industry groups, notably business services and wholesale trade, are growing in large part because of their ties to new economy industry groups.

A high-tech economic base has both positive and negative effects. It creates high-quality jobs and rapid employment growth in economic upswings, but is vulnerable to rapid declines when the economy falters. Economic diversity is therefore a desirable goal.

Given the trends of the 1990s, it is clear that Fremont's future lies in the new economy. However, other industry groups still have important roles to play in the city's job base. Wholesale trade supports new economy industries, and many of Fremont's other industry groups provide jobs for the city's diverse population.

New economy industry groups have high wages, and if they continue to increase their share of the city's employment base, the composition of Fremont's labor force will be changing. This will have important implications for Fremont's population, as the high-skill job base will tend to attract highly skilled and highly paid residents, who in turn will create demand for certain types of housing and amenities in Fremont. Efforts to attract and accommodate these residents will have to be balanced by strategies to maintain an economically diverse population and labor force in the city.

Finding 3: Fremont has developed some key areas of strength.

Employment growth trends and venture capital investments in the 1990s indicate that Fremont holds a leading position in the region in new economy manufacturing, particularly semiconductors, and an increasingly strong position in biotechnology. Venture capital data indicate that Fremont is a desirable location to start firms in both semiconductors and biotechnology, and employment data indicate that these firms are remaining in Fremont to grow. The city has assets that should position it well to capture a significant portion of the growth in these industries.

Although manufacturing, both traditional and new economy, may be moving out of Fremont, this is not necessarily an indication of a weakness. New economy manufacturing will likely follow the pattern of the semiconductor industry, which moved manufacturing out of Silicon Valley but left the most sophisticated activities there. As long as Fremont's main strengths remain and the city adapts to these changes, it can continue to attract a large share of this industry group.

Wholesale trade is also strong. This is an important industry group that supports the region's high-tech industries but that is generally more price-sensitive than high-tech firms per se. Nevertheless, even at the peak of the economic cycle, most of Fremont's wholesalers were able to pay rising rents, and owners of older industrial facilities did not, in general, upgrade their spaces. This indicates that wholesale activities serve an important economic function in Fremont and are able to pay their way.

Fremont has also developed a reputation as a good place to live, with excellent schools and a diverse and tolerant community. This will prove to be an increasingly important asset in the years to come.

Finding 4: Fremont also faces some significant challenges.

Although traditional manufacturing in Fremont has experienced healthy growth, it was assigned a competitiveness rating of weak because of stagnation and decline at the regional level. The prospects for traditional manufacturing in Fremont are unclear, and this industry group should not be counted on to contribute to growth in the future. At the same time, this may prove to be an opportunity: if traditional manufacturing firms leave Fremont, space will become available for newer, more dynamic industry groups that provide higher-quality jobs.

Despite the fact that software received a competitiveness rating of strong on the basis of rapid employment growth, its position is weaker than it would first appear. Both venture capital and employment data indicate that Fremont is home to many start-ups, but in general software firms don't appear to be choosing Fremont as a place to grow and expand. The city does not appear to be a prime location for larger and/or quickly growing software firms. The city's many small and new software firms encountered a shortage of appropriate office space in the last economic cycle.

Most importantly, the retail sector is performing poorly, as measured by both employment and taxable sales. Despite a growing and increasingly prosperous population, Fremont's retail base has not kept pace with the rest of its economy. This is not so much a problem from the employment perspective, since jobs in the retail and consumer services industry group rank low in job quality, but it does have potentially serious implications for Fremont's tax base.

In addition to these sectoral challenges, Fremont faces a number of others, such as the lack of a distinct regional identity, a paucity of high-quality mixed-use places, and the need to use land and real estate efficiently.

Finding 5: The competitive environment is different in every industry.

The three main new economy industry groups (new economy manufacturing, biotech, software) show very different spatial patterns at the regional level. These spatial patterns have important implications for Fremont's competitive strategy.

New economy manufacturing generally, and semiconductors specifically, are very concentrated geographically. Much of Fremont's appeal to semiconductor-related firms is due to its proximity to Silicon Valley and its role as "the next logical place to go" for firms priced out of the heart of Silicon Valley. This position is solidified by the city's other assets. There is some evidence that some semiconductor firms are also locating in the Tri-Valley area, although this is more of an incipient trend than with software. Fremont's strategy in these industries should be to maintain its advantage by focusing on the factors that make it a desirable location. The arrival or departure of an individual firm is less important than the factors that will, in the long run, guarantee Fremont's competitive position.

Software and biotechnology are more spatially decentralized than semiconductors, indicating that they choose from a much wider range of potential locations. Fremont appears to be doing reasonably well in attracting biotech firms, and should look for ways to strengthen its advantage.

However, most large software firms that choose to locate outside of Silicon Valley are bypassing Fremont altogether and locating in the Tri-Valley area, which provides a large amount of high-quality office space at reasonable prices, a large resident labor force, and a concentration of software companies. An important exception is technical software (i.e., software for semiconductor applications, etc., as opposed

to business software), which shows much more of an inclination to locate close to the heart of Silicon Valley and does not see Fremont as close enough. It is unlikely that Fremont will be able to compete on a large scale for the software firms that are choosing to locate in the Tri-Valley area. The city may be able to attract more technical software firms on the basis of its proximity to Silicon Valley and its entrepreneurial resident base. But a better strategy would be to find a niche in which the city can compete on the basis of its unique assets rather than going head-to-head with other areas.

Finding 6: Each of Fremont's subareas has a unique character.

The geographic distribution of total employment, as well as of quality jobs and jobs in strong and weak industry groups, clearly reveals the very different characters of Fremont's subareas. Industrial contains roughly 60 percent of Fremont's total jobs and quality jobs. Other areas, such as Niles and Mission San Jose, are mostly residential and make little contribution to the city's job base, but they do have important historical assets and unique character.

The subareas have evolved in this way because of historical factors, geography, available land supply, and so on. In most cases, the factors that have determined the character of the subarea are still present, and it would not make sense to try to work against those forces. In a few cases, however, subareas are not necessarily living up to their potential. These facts suggest that city policy should be tailored to each area to maintain, strengthen, or change its character depending on its role.

In all cases, subareas could benefit from place-making efforts intended to enhance their function in the city and give them unique status in the region.

RECOMMENDATIONS

Recommendation 1: Build on Key Assets

Fremont should build on its key assets rather than attempting to compete on the terms of other cities. Fremont cannot provide large amounts of affordable office space in close proximity to new single-family housing as easily as, say, Livermore. It can, however, provide things that Livermore does not, such as better access to Silicon Valley and greater demographic diversity. Following are the key actions that Fremont should take to enhance these assets.

Build on the City's Diversity

The city's goal should be to make Fremont an even more attractive place for talented and entrepreneurial residents and for a wide range of businesses. Fremont can maintain and enhance its economic and demographic diversity by providing a wide variety of real estate types, both commercial and residential; by enhancing the unique identity of each neighborhood through place-making strategies that capitalize on each neighborhood's assets; and by making retail diversification a primary goal, including the development of specialty retail that caters to different demographic groups. Building new transit-oriented neighborhoods near BART stations can help create more options of places for people to live and work.

Make Education a Priority

Fremont already has a strong school system. However, schools should be viewed as an economic development asset and their role in the city's economy should be taken into account when determining educational policy. Schools should both respond to and help attract a diverse population, in socioeconomic and ethnic terms.

Capitalize on Fremont's Geography

For the foreseeable future, Fremont will remain at the edge of Silicon Valley. This location makes Fremont especially attractive to firms that require a combination of proximity to Silicon Valley and affordable real estate. While Fremont's position in the region may not change, the type of firm that desires the features it offers may, particularly as industries restructure and the spatial dynamics of the region as a whole change. For example, certain types of software firms may find in the next economic cycle that Silicon Valley has become too expensive for them, but they may want to remain closer to the heart of the valley than the Tri-Valley area. Fremont could prove an ideal location for them, just as it has for certain parts of the semiconductor industry.

Fremont should keep abreast of such changes and target the industries, firms, and activities best suited for its location. In addition to active recruitment, the city can make itself attractive by providing the resources those firms seek, most notably appropriate, high-quality, reasonably affordable real estate.

Ensure Appropriate Real Estate

As the dynamics of the regional economy change, Fremont should ensure appropriate real estate to meet these industries' future demand for space. Firm needs may change over time, as is indicated by the increasing proportion of office and R&D space in Fremont and the relative decline of manufacturing space. Small office spaces were in short supply throughout the city during the last economic cycle, and increasing the supply of such spaces could attract start-up firms, particularly in software.

Fremont should also push for a housing stock that keeps up with employment trends both qualitatively and quantitatively. Fremont's residential offerings should grow to keep pace with the city's population and job growth, they should reflect the city's diversity of incomes, cultures, and household types, and they should provide choices that might be in short supply in nearby cities, such as appealing downtown housing with supporting amenities.

Use Land More Efficiently

The redevelopment of underutilized land allows more efficient use of Fremont's limited land supply. Ultimately, this will allow the city to maximize its share of regional employment and, if designed properly (i.e., with mixed use and in conjunction with transit), may help to alleviate congestion and other problems often associated with development. The city should encourage more intense development of both new and redeveloped sites.

Enhance Community Quality

As part of its overall economic development strategy, the city should focus on the quality of life factors that have made Fremont an attractive home for well-educated workers, entrepreneurs, diverse ethnic groups, and families. This includes tangible assets such as schools and parks but also intangible ones such as the city's reputation of diversity and tolerance.

Capitalize on Transit

Fremont has significant transit infrastructure, with more in the works, but has done relatively little to capitalize on it. The city should maximize the value of Fremont's transit infrastructure and advocate for better transit connections within Fremont and between Fremont and other parts of the region. More intense development around transit stations is a key strategy; both downtown Fremont BART and the future Warm Springs BART station should have detailed, focused planning efforts aimed at laying the foundation for effective transit-oriented development. The city should also push for improved bus and shuttle service between transit stations and local employers.

Consider Residents an Economic Development Asset

Fremont's educated and diverse workforce should be viewed as one of the city's main assets. In addition to focusing on the quality of life factors that will help the city continue to attract talented residents, the city should pay more explicit attention to the role that residents can play in economic development. Many Fremont residents may be inclined to start firms in the city but need a little extra persuasion or incentive. The city can find out what these entrepreneurs look for when they choose a location and make efforts to provide it. This should be a "high road" economic development strategy that focuses on building community assets rather than on providing short-term tax breaks and other such subsidies.

Recommendation 2: Create New Assets

The assets mentioned above have allowed Fremont to register the successes of the 1990s. In order to address its weaknesses and challenges, the city must not only build on its existing assets but also create new ones. Following are the principal actions the city can take in this regard.

Make Unique Places

All neighborhoods would benefit from efforts to enhance their unique qualities and create new ones, including specialty retail. This section will discuss one case in particular, the central business district, since it is the largest potential project. A healthy downtown is not merely a luxury or desirable amenity; it is an integral part of a comprehensive economic development strategy. A vibrant downtown would support economic development in the following ways:

- By contributing to Fremont's quality of life, the downtown can attract well-educated residents to the city, including entrepreneurs who may choose to start their company in Fremont.
- The CBD has a major asset—the BART station—and more intensive mixed-use development in the downtown area can help ensure that that asset is used more effectively.
- A downtown retail environment can help Fremont boost sales tax revenue and build a niche strength in the sub-regional retail market.
- A vibrant downtown can serve as an important amenity for many businesses. Small downtown office spaces could attract certain software firms, helping Fremont strengthen its competitive position in software by playing an incubator role.
- Downtown housing could attract residents that are looking for a unique residential product in short supply in Fremont and surrounding cities.

The CBD concept plan constitutes a good framework for the creation of a vibrant downtown in Fremont. However, little has actually been build. The city should take the time during this economic lull to prepare for the next economic upswing. Specifically, the city should:

- **Promote residential development.** Residents are crucial to the success of any downtown redevelopment. The city should ensure a range of housing types and prices, including housing suitable for families. Most downtown housing should be medium density (townhouses, apartments, and condos), with some of it integrated into mixed-use development. All housing should be integrated into the surrounding development to create an urban feel that can be one of the distinguishing features of downtown development. The city should consider supporting residential development with resources such as tax-increment financing.
- **Help develop retail with local and regional draw.** Develop a comprehensive retail strategy that can serve residents and businesses alike. Also encourage uses that will attract customers from throughout the city and the region, such as specialty restaurants.
- **Encourage small speculative office projects.** Spaces ranging from 500 to 2,000 square feet will be in great demand by software start-ups during the next economic cycle. A certain number of spaces ranging from 2,000 to 10,000 square feet will also be viable.
- **Streamline the development process and work with developers.** Publish a plan with a clear zoning code and clear design guidelines. Developers should know what is expected before investing time and resources. Streamline the entitlements process to expedite desired development. Build up relationships over time with high-quality developers. Offer city-owned land at a reduced price to developers willing to build key elements of the downtown plan.
- **Use downtown development to capitalize on transit connections.** Encourage transit-oriented development in the immediate vicinity of the BART station and plan for good pedestrian, bicycle, and transit connections from the station to the entire downtown area. Consider innovative parking strategies such as reduced parking ratios, parking assessment districts, etc.
- **Connect downtown to the rest of the city.** In addition to being a vibrant neighborhood in and of itself, downtown should play a unique role in the city. This requires that it be well connected. Although the edges of downtown should be clearly defined, they should also constitute connections to other viable neighborhoods, employment centers, and shopping areas.

- **Pay close attention to quality of life.** Push for high design standards and a wide range of amenities (high-quality streetscaping and public open spaces). Carefully manage potential conflicts between different uses.

Create Connections to the Region

With the growing importance of the software industry in the Tri-Valley area and the 680 Corridor, Fremont will want to ensure its connections to the relevant labor force in those parts of the region. The importance of biotech in SF and the peninsula, especially when Mission Bay is built, means that connections across the bay will be very important for that industry. The semiconductor industry still has its main concentration in San Jose, so Fremont must ensure that it is accessible from the south.

Specific strategies include pushing for a rail link across the Bay, expanded ACE service, a BART extension to San Jose, regional express buses, and high-quality internal transit links, as well as targeted freeway improvements and investments in Fremont's own road infrastructure to minimize congestion. These elements will help ensure that Fremont is solidly part of a regional labor force and well connected to the various concentrations of all its key industries. Complementary land use and development policies can ensure that the benefits of the transit infrastructure is maximized.

Forge an Identity and Image

Fremont should enhance its image as a good place to live, work, shop, and play. The city's economic strengths and demographic diversity are obvious assets that should be highlighted. Fremont can also make itself known as a city that offers unique options for housing, retail, and entertainment. Fremont is the fourth largest city in the Bay Area but lacks the kind of identity that other large cities—and some smaller ones—enjoy.

Fremont can create a niche for itself and build an image that will contribute to its economic development goals through place-making efforts, unique retail opportunities, high-quality transit-oriented development, and developments such as Pacific Commons. All of these elements will help impart a clear identity and image to the city.

Recommendation 3: Develop a Separate Competitive Strategy for Each Industry

The different spatial patterns described above, along with Fremont's varying degrees of success in attracting different industries, suggest that the city should adopt a different strategic approach for each key industry group.

New Economy Manufacturing and Semiconductors

Fremont's strengths and competitive advantage in new economy manufacturing industries, and semiconductors in particular, are so clear that it would be a mistake for the city to pay too much attention to the fortunes of individual firms. In this industry group, then, Fremont should focus on *maintaining* and *strengthening* its advantage.

Although one of Fremont's greatest assets—its location—is an accident of geography, much of its competitive advantage is based on other factors subject to more direct control. The following are key elements of a competitive strategy:

- **Focus on overall competitiveness, not individual firms.** The departure of a firm like Flextronics should not be viewed with alarm as long as the city continues to provide the locational advantages that can attract other firms. This event is consistent with the ongoing dynamics of the industry and the region and indicates that Fremont's role is changing, not diminishing.
- **Focus on assets, not business cycles.** Just as individual firms come and go, business cycles are inevitable and should not distract the city from its primary task of maintaining the assets that have allowed it to be successful. New technological developments in the semiconductor industry seem to indicate that Silicon Valley—and many of the current players in the industry—will retain their dominance for some time to come. When the economy picks up speed again Fremont will be in an excellent position to capture some of the growth.
- **Ensure adequate land supply and real estate.** Developers should be encouraged to use land more intensively by building at higher densities. The city should try to anticipate and plan for changes in the demand for different types of space.
- **Tap into the resident entrepreneur base.** Some of Fremont's most important future firms may be started by Fremont residents. The city should promote Fremont as a location to this group and learn from them how to make the city a better place for entrepreneurs.
- **Ensure good connections.** The advantage of proximity is negated if access is difficult. Good connections to San Jose and the rest of Silicon Valley are crucial for promoting labor force mobility and inter-firm interaction. The city should take steps to reduce congestion by ensuring the quality of its transportation infrastructure and by encouraging alternatives to single-occupancy vehicles such as carpools. Transit can play an important role in reducing congestion and strengthening Fremont's connections.

Biotechnology

In biotechnology the city should concentrate on *consolidating* and *strengthening* its advantages. Biotech seems to be clearly capturing more and larger investments than would be expected given Fremont's overall venture capital performance, and venture capital and firm formation data indicate that Fremont is a desirable location for young biotech firms and start-ups. However, the city may not be capturing all of the larger and growing biotech firms that it could. The strategy should focus on meeting the needs of these firms so that they remain in Fremont rather than seeking space elsewhere when they grow. The Ardenwood area in Northern Plain is a key location for biotech and should be one focus of the city's efforts to create the conditions these firms seek.

Software

In software the city must *create* an advantage. Most software firms are either willing to pay a premium to be in Silicon Valley or prefer the Tri-Valley area to Fremont. The city should not engage in a losing strategy to try to lure these firms to Fremont, especially if that means neglecting the city's core industries. Instead, Fremont should focus on the firms that fall into neither of the above categories. The combination of the resident entrepreneurial population and labor force, proximity to both Silicon Valley and the Tri-Valley area, good transit connections, and appropriate development could give Fremont a powerful edge in fostering, attracting, and retaining certain types of software firms.

- **Create a niche.** Fremont can play an important incubator role for start-ups and smaller software firms. The city should target firms that value Fremont's current and future assets, that is, firms attracted to a downtown environment with transit, firms with ties to resident entrepreneurs, and firms looking for small, affordable spaces close to Silicon Valley.

- **Provide appropriate real estate.** Central and Northern Plain are both candidates for the 500 to 2,000 square foot spaces that many software start-ups are looking for. Central can provide a range of other amenities in addition, including urban-style housing options.
- **Ensure connections.** Fremont should increase its desirability vis-à-vis the Tri-Valley and Silicon Valley by ensuring good connections to the labor force in those areas.

Retail

Fremont can't compete on the basis of large freeway-oriented retail. In retail, as in software, the city must focus on creating an advantage by developing niche strengths. Fremont can capitalize on its diverse, prosperous, and growing population to develop a successful retail strategy that revolves around the creation of unique places and options. This requires creating physical environments for high-end retail and explicitly taking into account the preferences of Fremont's different communities.

Most importantly, the city should create a unique downtown retail environment. Unlike cities in Santa Clara County and San Mateo County, Fremont and its neighbors lack attractive, vibrant mixed-use urban centers. By developing such a downtown, Fremont could position itself to provide a unique retail experience. Small-scale independent retailers, a wide selection of restaurants, a pedestrian-friendly retail environment, all combined with anchors such as a cinema and larger retailers, could attract retail dollars from Fremont and beyond.

In the Bay Area, Mountain View and Walnut Creek provide compelling examples of downtown revitalization/creation in the vicinity of a transit station. Intensive residential development in Fremont's Central subarea would support the retail sector, as would a healthy downtown employment base.

Neighborhood retail centers should embody these principles on a smaller scale, creating unique places that take advantage of Fremont's diverse population.

Recommendation 4: Build on Fremont's Current Spatial Patterns

Fremont's subareas have strong characters and play very different roles in the city's economy. City policy should recognize these differences and not try to change spatial patterns without good reason. Industrial clearly is the most desirable area in Fremont for the city's core economic activities, and the area's proximity to the freeway and supply of land means that it will be the focus of much of Fremont's future growth. Policy there should focus on maintaining and strengthening this role. Industrial is not a suitable location for other activities. Northern Plain is also a key job generator, particularly in biotech, and promises to play more of an economic role in the future.

At the other end of the spectrum, the city's residential neighborhoods make poor candidates for employment centers given their locations, their relative lack of land supply, and potential conflicts between residential and other uses. Although some of these neighborhoods, such as Niles, may be able to support very modest employment growth, they will and should remain residential areas. Their value to the city is not tied to their employment base, but rather to their strength at what they do best: serve as high-quality places for people to live. This role should be strengthened by creating amenities, enhancing neighborhood identity, and both increasing and diversifying the housing stock.

The Central subarea, in contrast, has a very different mix of activities and would benefit from the addition of residential development, something that would not make sense in Industrial or Northern Plain. Central should be seen as an underperforming that neither provides all the jobs it could nor serves as a residential

neighborhood. Central could serve both of these functions and be an important retail center. Centerville could also conceivably play a more significant role in the city's economic life.

X. TECHNICAL APPENDIX

INTERVIEW METHODOLOGY

Interviews were conducted with two main categories of people: business founders/managers and real estate brokers. In addition, a smaller number of interviews was conducted with venture capitalists and others familiar with key aspects of doing business in Fremont (these were not more numerous primarily due to the difficulty of finding venture capitalists willing to take the time to answer questions). The interviews were intended to complement the quantitative components of the analysis with qualitative information. Interviews were open-ended rather than tightly structured, and they were designed to elicit different information depending on the person being interviewed. In broad terms, the interviews focused on the following types of information:

- Real estate brokers: Brokers are not only the best source up-to-date information on commercial rents for different types of space in different parts of the city, but they also have significant understanding of current business trends, including the needs of different industries (factors underlying location decisions, desired real estate type, proximity to employees, etc.) and the market viability of different real estate products and locations. For example, real estate brokers were an important source of information regarding the viability of downtown Fremont as a location for small software firms and the type of environment that would prove attractive to such firms.
- Business founders and managers: Business leaders can provide insights into space needs and location decisions, including the extent to which they value proximity to BART and the viability of different locations for firms in different industries and at different stages of their life cycles. Business leaders and entrepreneurs in the high-tech industries were a good source of information about the important role that Fremont's immigrant population plays in the city's entrepreneurial activity.
- Venture capitalists: Although venture capitalists proved more difficult to reach than other interview subjects, they are among the best sources of information on the way firms are founded, the characteristics of their founders, their location decisions, and so on.

DATA, DATA SOURCES, AND DATA CONSTRAINTS

EMPLOYMENT DATA

There are a number of different classification systems that are used to divide economic activity into categories. The most commonly used in the United States is the Standard Industrial Classification (SIC), first developed in the 1930s and periodically revised and modified. Many of the assumptions inherent in the SIC are no longer valid, and even the periodic revisions are unable to address many of the resulting problems.

For example, the difficulties in using SIC data to analyze high-technology industries are notorious, due in large part to a basic differentiation between "manufacturing" and "services" that is increasingly invalid. For example, electronics, semiconductors, and aerospace equipment are all considered to be manufacturing and are grouped together. However, high-tech R&D, software, and biotech research are

considered to be services and are located elsewhere. In reality, many of these activities (e.g., software and semiconductors) are often closely linked, while a good deal of electronics manufacturing is not "high tech" at all but rather low-skill, low-wage labor.

Sometimes it is possible to overcome these problems by dividing up categories and regrouping them in a more suitable way. However, data confidentiality issues often make this impossible. In general, public data are suppressed when the number of firms in question is very small. For example, if there is only one firm in a particular four-digit category in a city, the data will simply indicate that fact without providing information on employment, which could easily be connected to that firm. When this is the case, it is not possible to disaggregate the data enough to create a more suitable grouping of economic activities.

The North American Industry Classification System (NAICS) was developed by the governments of the Canada, Mexico, and the United States to facilitate comparison of the three NAFTA economies. The new system was put into use in the United States in 1997 and has replaced the SIC for national-level economic data. NAICS is production-oriented, meaning that the primary criterion used for grouping activities together is the type of production process employed, rather than the nature of the final product. Two notable results of this conceptual foundation are a much less rigid distinction between manufacturing and services than the one inherent in the SIC, as well as the presence of an Information sector that groups together many multimedia and software activities, among other industries.

Although there are many ways of measuring economic activity (by sales, value-added, gross revenues, and other earnings or output indicators), employment is the most commonly-used proxy in urban and regional economic analysis. Like any variable, employment has drawbacks as a measure of economic activity. For example, growth in industries that are experiencing rapid productivity increases will be understated by measuring employment growth.

Nevertheless, employment remains the standard, mainly due to the relatively greater availability of employment data compared to other variables. Employment data for California cities and regions are readily available from at two sources, the California Employment Development Department (EDD) and Dun & Bradstreet. Each of these has advantages and disadvantages and allows different types of analysis.

This report uses data from both sources, but for different purposes. EDD data are available as a time series whereas Dun & Bradstreet data are not; therefore, the former were used to perform the analysis of economic performance between 1992 and 2000 in Fremont and the 5-County region. This includes growth rates, location quotients, and cluster competitiveness ratings. However, Dun & Bradstreet data were used for the subarea analysis because they include firm-level data, including addresses that allow employment data to be represented spatially using maps and a geographic information system (GIS). Some components of the analysis, such as a mapping of the competitive ratings of clusters represented in a particular subarea, rely on both data sets.

The two data sets are not necessarily compatible; that is, they show somewhat different figures for total employment at the cluster or SIC code level. However, they are similar in their broad outlines, e.g. total employment, relative sizes of clusters, etc.

In addition, there are a number of problems with the data. For example, since the California Employment Development Department (EDD) receives employment reports by payroll address, Fremont-based employees of a firm that maintains its administrative functions elsewhere will generally not appear in the data. Conversely, a firm based in Fremont but with employees in other cities will appear to have all of its employees in Fremont. While these problems tend to not be significant when dealing with large industries or geographic areas, in the case of a small sector in a single city the error can be significant.

In general, such problems of geographic coding have been reduced over the course of the 1990s. Nevertheless, they are not entirely resolved, and an analysis such as this one which includes 1992 data will inevitably encounter difficulties.

In cases in which there are fewer than five firms in a particular SIC category, or in which a single firm has more than 80 percent of total employment, EDD suppresses the employment data for confidentiality reasons. Data for some three- and four-digit SIC categories are therefore reported with only the number of firms but not the number of employees. EDD does provide the sum of the employment in those confidential categories.

Strategic Economics estimates employment in suppressed categories as follows. For four-digit categories, confidentiality was dealt with by applying the average firm size in the relevant three-digit category to the confidential firms. That is, it was assumed that thy represent the same proportion of employment that they represent in number of firms. There were few of these cases, and none in Fremont. For all other industries, the overall average number of employees per confidential firm was calculated for each area (county or city) and applied to each SIC category with suppressed data.

Although this methodology is of course imperfect, there is no alternative given EDD's policy on data confidentiality. However, experience shows that the results seem to be quite accurate. For example, comparisons of EDD data aggregated according to this methodology to Dun & Bradstreet data yield quite similar results.

BREAKING DOWN AN ECONOMY

Aggregate-level economic data are useful for painting a very general picture of an economy's performance by providing information on total employment, employment growth, wage levels, and so on. However, in order to gain a deeper understanding of the nature of an economy—e.g., whether it is service-oriented or based more heavily on manufacturing, what industries are strong, how the composition of the economy is changing—it is necessary to use disaggregated data.

There are several ways to divide economic activity into categories. A *sectoral* breakdown divides the economy into basic categories, such as agriculture, industry, and services, as well as smaller subcategories, such as food processing or legal services. Such a breakdown is based on traditional (and for many purposes outdated) concepts of economic activity and divides activities mainly according to the nature of the final product.

A different technique, *cluster analysis*, represents an attempt to group businesses together on the basis of relationships, whether input-output relationships, shared markets, or learning relationships. Clusters open the door to a type of analysis which more explicitly recognizes that, for example, although agriculture and food processing are normally grouped in different sectors, in fact the two are usually complementary and can be viewed as belonging to a single cluster. Although the City-defined groupings used in this analysis are called clusters, they do not necessarily adhere to a strict definition of clusters.

A third approach, the one used in this analysis, might be termed *industry groups*. Industry groups are an attempt to overcome some of the shortcomings of traditional sector descriptions by defining categories less strictly by the nature of the final product, but they do not take into account inter-industry linkages as explicitly as do clusters.[21] The industry groups for Fremont were defined on the basis of three-digit SIC

[21] Note that the term cluster has become quite fashionable, and is often used even in cases where it is not strictly appropriate, e.g. when inter-industry linkages have not been explicitly taken into account.

codes, with a few four-digit categories (3559, 3674, 7371, 7372, 7373, 7374, 7379) used to better define high-tech industries.

Deciding how to break an economy into smaller categories is not an exact science. Different aggregations are appropriate depending on the nature of the analysis, the qualities of the economy being studied (e.g., a service-oriented urban economy vs. a regional economy with a significant agricultural and industrial base), and data constraints.

REAL ESTATE DATA

Real estate data were collected from First American Real Estate, RAND, and the quarterly reports of major brokers. Extensive interviews with commercial brokers supplemented these sources.

TAXABLE SALES

Taxable sales figures are from the California Board of Equalization. Population figures are from the California Department of Finance. 1990 numbers are based on census data. 1999 numbers are based on estimates for January 1. Adjustment for inflation was done on the basis of consumer price index (CPI) data from the U.S. Bureau of Labor Statistics.

VENTURE CAPITAL

Venture capital data were taken from PricewaterhouseCoopers Moneytree. Although the surveys used to collect this information are almost certainly incomplete, these numbers do serve as useful and important indicators of recent activity in high-tech industries.

ANALYTICAL METHODOLOGY

Some standard techniques of local and regional economic analysis were used. These techniques are intended to paint both static and dynamic portraits of Fremont's economy in order to understand its strengths and weaknesses, how it compares to other cities and to the larger regional economy, and how it is changing.

STATIC MEASURES

Location Quotients

Location quotients are a simple technique for measuring the relative concentration of jobs in a particular industry group in a subject economy (e.g. a city) compared to a larger reference economy (e.g. a county). A location quotient greater than 1.0 indicates that the subject economy is more specialized than the reference economy in the industry in question, while a number lower than 1.0 means the opposite.

Location quotients are calculated according to the following formula:

$$\frac{I_1 / T_1}{I_2 / T_2}$$

where:

I_1 = Employment in industry (or sector/cluster) in question in subject economy
T_1 = Total employment in subject economy
I_2 = Employment in industry in question in reference economy
T_2 = Total employment in reference economy

Job Quality

The quality jobs measure used for this study was based upon average wage data for occupations in California. Using the state-level EDD matrix of the mix of occupations in each SIC category and local-level wage data from 2000 for each of those occupations, the percentage of jobs in each three-digit SIC category paying a wage higher than a cutoff "living wage" level was calculated.[22] Calculations of the proportion of quality jobs in each industry group were done by applying these percentages to Fremont's employment data.

The living wage standard employed in this analysis was based on a 1999 cost estimate by the California Budget Project of all living expenses (including housing, childcare, food, and transportation costs) that would be incurred by a family unit of a given size, structure and age. This means that the number and age of children in the household was factored into living expenses, as well as the number of parents present. For the six main counties of the Bay Area, the "self-sufficiency standard" was as follows:

Single-Parent Family	$21.24
Two-Parent Family (One Working)	$17.56
Two Working Parent Family	$12.92

The middle figure of $17.56 was chosen for the analysis and inflated to 2000 cost levels using the CPI.

DYNAMIC MEASURES

Dynamic measures show changes in the economy over time. As in the case of static measures, these are presented both for the subject economy alone and in a comparative format. Dynamic measures include such figures as change in sectoral employment over time, a comparison of sectoral changes in Fremont and other cities (or Fremont and the county as a whole), and shift-share analysis, described below.

Shift-Share Analysis

Although measuring job growth or decline is an important indicator of economic performance, the number of increasing or declining jobs alone does not explain the underlying forces causing these trends, or suggest any clear policy implications. By using a more sophisticated statistical methodology—shift-share analysis—to measure employment growth in a subject location against employment growth in a larger reference economy over a given time period, it is possible to gain more dynamic and in-depth information about employment change in the subject economy.

Change in employment in a given subject economy can be attributed to three factors:

1) Overall change in the larger regional (or national) economy.
2) Change in the industry group in question at the level of the larger regional (or national) economy. This is often called the industry mix effect, because the distribution of employment in the subject

[22] It was assumed that the occupational mix for each SIC category represented in Fremont was the same as for the state as a whole.

economy among slower- and faster-growing industries has an effect on overall employment in that economy.

3) Performance of the industry group in question within the subject economy due to local conditions. Put differently, this is the change in the subject economy's share of total (national or regional) employment in the industry group in question. This can be referred to as the regional shares effect.

Looking at local employment change alone will tell us little about the nature of that change. For example, overall economic growth in the larger regional or national economy will lead to an increase in employment in most industries, or at least slow their decline. Without further analysis, it is difficult to determine if growth in a particular industry group in the subject economy is driven primarily by local factors such as increased competitiveness or simply by strong economic performance in the larger regional or national economy.

Shift-share analysis permits us to separate out the impact of these three different factors on employment change. By explaining which factor or combination of factors is driving employment trends, it is also possible to define the "economic competitiveness" of each sector or industry group in the subject economy relative to the larger reference economy.

COMPOSITE MEASURES

Numbers alone are only so helpful, and often they require significant time to absorb and understand. Therefore, Strategic Economics has developed "competitiveness ratings" that qualitatively summarize the composite results of a number of static and dynamic measures, including the shift-share analysis. Clearly no such rating can fully take into account the complexity of a changing economy, nor can fixed classification criteria be substituted for human judgment. Nevertheless, these ratings provide a useful starting point.

These ratings combine measures of the local performance of a particular industry group with measures of that group's performance regionally. That is, they take into account both the competitiveness of an industry in a particular city and the viability of that industry regionally. An industry which is growing in one city cannot be considered strong if its prospects at the regional level (which will ultimately affect its local viability) are not good.

The indicators are defined as follows:

- **Strong.**
    1. Regional growth in this industry group equals or exceeds overall regional growth and local growth in the industry group is at least as great
    2. OR regional growth in this industry group equals or exceeds overall regional growth, local growth is at least 75 percent of that level, and local factors are strong (i.e., the share effect explains at least half that growth).
    3. **OR** regional growth in this industry group is positive (but below the overall growth level) and local growth is at least 75 percent of that level. At least half of local growth must be explained by the share effect.
- **Stable.**
    - The industry group fulfills the criteria 2) or 3) above but local factors are weak (i.e., less than half the local growth is explained by the share effect).
- **Emerging.**

- The industry group fulfills the criteria for being classified as strong but represents less than 2 percent of total local employment.

- **Weak.**
  1. Regional growth is negative and local growth is positive
  2. OR regional growth is positive but local growth in the industry group is less than 75 percent of regional growth
  3. OR regional growth is positive and local growth in the industry group is greater than 75 percent of regional growth but there is a negative share effect (i.e., local growth can be explained entirely by regional factors and the industry is being adversely affected by local conditions).
- **Declining.** Employment is declining locally.

Some sectors have been designated "key" industry groups by virtue of having a location quotient greater than one and a share of total employment exceeding 10 percent. The interpretation of such a label changes, of course, depending on the strength of the sector. For example, a "key" group that receives a ranking of weak could be considered "at risk" given its importance in the local economy.

The above categories are not 100 percent mutually exclusive given the criteria described above. In a very small number of cases it is necessary to choose one of two rankings (e.g. stable, weak) based on a closer look at the numbers.